

12-


Prominent Men I Have Met

DR. WILLIAM TRELEASE

T. G. Yuncker

23
\$12-

III



Digitized by the Internet Archive
in 2014

PROMINENT MEN I HAVE MET

DR. WILLIAM TRELEASE

By

L. H. PAMMEL, B. Agr., M.S. Ph. D., D. Sc.

Head Botany Department

Iowa State College

III

AMES, IOWA

1927

DEDICATION

TO DR. WILLIAM TRELEASE:

Your former students and associates have asked me to present to you the following sketch of your life, with an appreciation of your service to science as a teacher, investigator and executive. This is made a part of the series "Prominent Men I Have Met."

L. H. PAMMEL.

Presented at Urbana, Illinois,
December 24, 1927.

ACKNOWLEDGMENTS

The writer wishes to express his thanks to the numerous friends who have written letters to Dr. Trelease on the occasion of his retirement from the University of Illinois and for his long and distinguished service as a teacher at the University of Wisconsin, Washington University, and the University of Illinois. I also wish to acknowledge my deep obligations to Miss Charlotte M. King of the Department of Botany, Iowa State College, who has read the proof of the sketch of the life of Dr. Trelease. I am under obligations to J. Christian Bay of the John Crerar Library, Chicago, Illinois. For the Trelease bibliography I am under obligations to Miss Mary Hagan of the Department of Botany, University of Illinois. Also I wish to acknowledge the assistance received from Dr. A. L. Bakke and Miss Marjorie Hanson. I am indebted to the Powers Press for running a part of the material in the Ames Tribune.

L. H. PAMMEL.

DR. WILLIAM TRELEASE

Some of the students of Dr. William Trelease wish to acknowledge in an appreciative way his long service to science as a teacher and an investigator on his retirement from the headship of the department of botany of the University of Illinois. These students have asked me to present the letters attached and to write a formal sketch of his activities and his scientific contribution. This sketch is made a part of a series of articles on "Prominent Men I Have Met" running in the Ames Tribune. The University of Illinois, in honoring his service in June, 1926, presented the following concise statement of his activities in the field of botany:

"Prof. William Trelease, who retires at the end of the academic year 1925-26 from headship of the department of botany at the University of Illinois, has been elected one of the nine honorary members of the Societe Botanique de Geneve, in recognition of his botanical work.

"Since graduating from Cornell University in 1880 and receiving the doctorate from Harvard in 1884, he has served successively as head of the department of botany in the University of Wisconsin, Washington University, and the University of Illinois. In 1885 he was selected by Henry Shaw for the task (which fell to him in 1889) of converting a gentleman's private estate, the celebrated "Shaw's Garden" of St. Louis, into a scientific institution, the Missouri Botanical Garden, which he left in 1912 with an established reputation among the foremost botanical gardens of the world.

"During his long professional career he has been honored with membership, and often the presidency in many scientific bodies, and has received honorary degrees from several universities. His frequent publications on natural history include monographs of yuccas, century plants, mistletoes, a flora of the Azores, and a fully illustrated account of the American oaks that appeared in the spring of 1925 as a volume of the Memoirs of the National Academy of Science."

Dr. Trelease has held the following positions: In charge of summer school botany, Harvard, 1883-84; lecturer botany, Johns Hopkins, 1884; instructor botany, 1881-83; and professor 1883-84, University of Wisconsin; professor botany, Washington University 1885-1913; director Missouri Botanical Garden 1889-1912; professor of botany, University of Illinois, 1913-26.

The other activities of Dr. Trelease may be briefly summarized: He was chairman American Board of Editors, Botanisch-

es *Centralblatt* 1900-21; fellow American Academy of Arts and Sciences 1892, A. A. A. S.; member National Academy of Sciences 1902, Am. Philos. Soc. 1903, etc.; directeur (president) *Academie Internationale de Geographie Botanique* 1896; first president *Botanical Society America* 1894-95 and 1918; president Am. Soc. Naturalists 1903, Cambridge Entomological Club 1889; Engelmann Botanical Club 1898-99 (honorary president since 1900); secretary Wisconsin Horticultural Society 1882-85; Academy Science of St. Louis 1896-1903 (president 1909-11); member Round Table (St. Louis), Delta Upsilon, Sigma Xi, Phi Beta Kappa. He was editor (with Asa Gray) *Botanical Works of the late George Engelmann*; translated Poulsen's *Botanical Micro-Chemistry* and Salomonsen's *Bacteriological Technology*. Author of *Agave in the West Indies* 1913; *The Genus Phoradendron* 1916; *Plant Materials of Decorative Gardening* 1917-21; *Winter Botany* 1918-25; *The American Oaks* 1925.

Dr. Trelease was the first person in this country to actually give some bacteriological work at the University of Wisconsin in the early eighties. It was fitting therefore that the American Bacteriological Society should have met at Madison, Wisconsin, on December 29th, 30th and 31st, 1925. I recall the very interesting cultures of bacteria made by Dr. Trelease in his laboratory and his discussion of some of the problems of bacteriology to some of his interested students. He was chairman of the organization committee and first president of the Botanical Society of America, and the first chairman of the committee on botany of the National Academy when it was established.

Let me briefly sketch the life of Dr. William Trelease:

Dr. Trelease was born at Mt. Vernon, New York, February 22, 1857, of Cornish English ancestry.

A few years ago I had the pleasure of meeting an Episcopal clergyman of the name of Trelease in Berkeley, Cal. I told him that I had a good warm personal friend and former instructor in botany, Dr. William Trelease. I suggested that the name must be Cornish, and he said that it was. I then wrote to Dr. Trelease in regard to meeting this clergyman to which he replied as follows:

"It was good of you to remember me with the reminder of the Cornish clergyman of the same name. Pol, Tre, and Pen are safe guides to names from 'the country'; but there are very few of my own name even there now. The Kingsleys and other friends have spoken of meeting and liking this bearer of it, and some day I may have that pleasure."

He lived in small villages until the age of fifteen. It is hard to tell how one may become interested in a given subject. In a recent letter he tells me that he recalls the horse-tail and blue-eyed grass in the yard of a New England home where some of

his playmates gathered 65 years ago; and at the age of six he brought out a dog-toothed violet from among the shrubbery in the garden, and at 12 he began to roam in the Connecticut woods, to trap and soon thereafter to hunt as all boys are eager to do. An interesting book, "Samuel's Birds of New England," gave him a new incentive to become more intimately acquainted with the bird life "dip into natural history."

A great teacher can do wonderful things in awakening an interest in a subject in the student. Such a man was Apgar, the teacher who is known to many as the author of the "Analysis of Plants." "It was seven years after, from a teachers' institute demonstration by Apgar, I first found out how to learn the names of plants,—and I learned the names of a good many before entering college a year later." He has told this to us in an address delivered a few years ago on the evolution of a botanist:

"I owe a lasting and unpayable debt of gratitude to Austin Apgar of the Trenton normal school for once having shown me and a roomful of other fledglings how easy it is to see and note what it is necessary to see and note in order to find out what a plant is called. I never have had a bit of instruction in this delightful and fundamental pastime of "keying-out" things, beyond this one hour in which an admirable teacher showed me how to begin by using two books. These books went together like hand and glove; so of course they were published by one highly intelligent house.

"Apgar, to me, was a teacher. The makers of the books, to me, were the real botanists. To be sure, he had made one of them, but it was designed to lead to the use of the other. From that moment, Asa Gray, the maker of that other book, became a giant on my horizon, and he did not grow overpowering when in later years I came nearer to him, nor has he shrunk in the many years that have passed since I was with him."

At Bradford, Conn., Professor Trelease had another contact which was a most important one in his life, which was during his last year in the high school 1871-72, namely the contact with Leonard Parish, who, fresh from Yale and with the spirit of youth, brought a vigor and a personality into the high school which counted for much. He was not a naturalist but a classicist. He was inspiring. Abbott Page of the Iowa State Normal was another boyhood friend.

It was his bent in natural history that turned Dr. Trelease to Cornell University where he graduated in 1880, receiving the degree B. Sc. The courses at Cornell had a very liberal background so that it was possible to have French, German, Swedish, Italian, history, political economy and literature, and those who had the privilege of his company were always charmed by both

his fine personality and the breadth of his education. He conversed intelligently on history and literature as well as science.

Dr. Trelease got his start in the languages at Cornell. He is a good student of languages, otherwise it would not be possible for him to read and be able to readily translate from the Italian, German, Danish and French authors as he does. He had the advantages of working with a fine lot of teachers. They were young men—Wilder, Prentiss, Comstock and Henry Williams. All of these men, with the exception of Professor Prentiss, published much and no doubt stimulated young Trelease—Comstock, an authority in entomology, Wilder, an authority in anatomy, Henry Williams, the talented paleontologist and anatomist, who had been a student of Professor Marsh at Yale. He was fortunate at Cornell in another respect. He had fine student contact in the university at the same time—David Starr Jordan, zoology; Dudley, botany; W. A. Henry, agriculture; W. J. Lazenby, horticulture; Romeyn B. Hough, forestry; W. A. Kellerman, botany; J. C. Branner, geology, are some of the students I recall. In 1879 Professor Comstock was asked by the United States government to undertake a study of the insects of cotton. The opportunity came for Dr. Trelease to become connected with this entomological work. There was much routine work which was done well, but Dr. Trelease did more than study cotton insects. His spare moments were devoted to a study of problems connected with pollination of flowers and the flora of the region. The paper, *Nectar: What It Is and Some of Its Uses*, 1880, was one of the first of the important papers he published on the subject of pollination—a subject I shall refer to again.

It is appropriate here to refer to his interest in conservation and how his work touched Iowa State College. Dr. William Trelease was invited to address a meeting of the Iowa Conservation Association, held at Ames on February 2, 1917. At the time of this address I sent out the following notice, to which I have added data in regard to the time he held the position referred to in this invitation:

“The botanical department invites you to meet Dr. William Trelease of the University of Illinois at a luncheon in Alumni Hall on Friday, February 2, at 12. Dr. Trelease is one of the distinguished graduates of Cornell University. He worked with Dr. Comstock on cotton insects, a student under Dr. Gray of Harvard University, receiving the earned degree of D. Sc. Later he became professor of botany in the University of Wisconsin, lecturer on botany Johns Hopkins University. Became George Engelmann professor of botany Henry Shaw School of Botany, then director of the Missouri Botanical Garden, during the trying stages of its development. He served this institution

with distinguished ability, laying the foundation for one of the greatest botanical institutions in the Mississippi valley.

“Dr. Trelease is not only a teacher but is an investigator of the highest order. His contributions along the lines of ecology, pathology, mycology and taxonomy of seed plants are numerous.”

In introducing Dr. Trelease I made the following remarks which gives the connection of Dr. Trelease with Iowa State College:

“We have as our guest today, Dr. William Trelease of the University of Illinois, head of the department of botany of that great institution. It is a pleasure, indeed, to welcome Dr. Trelease a third time to this institution. The first time he came here upon the invitation of Dr. Bessey to look over the field to see whether he might be induced to accept the professorship, about to be vacated by Dr. Bessey. During the early regime of Dr. Beardshear he was invited to deliver a Sunday morning chapel address, and today we have invited Dr. Trelease to be one of the speakers on conservation. We have invited to this luncheon people who have in some way been connected with Washington, Cornell, Johns Hopkins and Harvard universities, the University of Wisconsin, University of Illinois and the Missouri Botanical Garden. Dr. Trelease occupies an important place in the field of botany in the United States, not only as a teacher, but as an investigator. In his work as an administrator he has shown rare executive ability. As a teacher he has endeared himself to those who have been fortunate enough to take work under him. As an investigator he has shown rare ability in working out the problem before him. Combined with all he has good sound rare scholarship.

“There are few here who know and appreciate the difficulties of botanical teaching 35 years ago. I want to remind the former students of the University of Wisconsin that I had my first botanical instruction in the old main building on the hill. The lectures were given in what was then the chapel and now is the office of President Van Hise or at least was his office at the time I last visited the university. It may be of interest to state that we used Bessey's textbook then just issued by the Holts. The following fall the quarters for the department were in Old South Hall. Professor Trelease had his office on the second floor at the south end and the lecture room was on the first floor and the laboratory on the second floor. Here we received our first instruction in cryptogamic botany as it was called, which was followed by courses on flower ecology and then systematic botany. While we were thus studying the oak during the winter term, Dr. W. J. Beal of the Michigan Agricultural College came into the laboratory and gave such a pe-

culiar pronunciation to 'Quercus' that I have always remembered it.

"Delightful hours were spent with Dr. Trelease discussing Darwin's Origin of Species and Pasteur's work on fermentation. A few of us enjoyed most delightfully reading in Dr. Trelease's home Ernest Haeckel's Descriptive Ceylon, a most charmingly written account of that island. Of the men who were then prominent in the university, only a few remain. Dean Birge is the only man I think who is still active. We all remember with delight J. B. Parkinson who explained to us Cooley's constitutional law. President Bascom, a clear thinker and a great teacher, gave us lectures on psychology and ethics. Professor Henry was the agricultural department, and under him we had a variety of courses in agriculture, livestock and farm crops. We had Dr. H. P. Armsby in agricultural chemistry, a well-trained man fresh from one of the German universities; Professor Frederick Power in pharmacy, also well trained in one of the German universities and who ably carried on the pharmacy work of the university for many years; Freeman in English literature; Frankenburger in elocution and rhetoric; Rosenstengel in German and German literature. In mathematics we had Mrs. Carson; geology, Roland D. Irving; and in chemistry, Daniels and Van Hise. You might well expect that the laboratory work under Van Hise in chemistry was well done, and that every student felt that the courses were worth while. During these days in the university a number of like minded students organized the Natural History Society. I recall as members Vaughan, Grotophorst, Ochsner, Falge, Chase, Schuster and myself. Der Deutsche Bildungsverein was also organized with nearly the same men, except a few additional members like Mr. H. H. Powers, Cabeen and Mrs. R. J. Taylor. These organizations, I believe, have continued their meetings up to the present time.

"Let us turn for a moment to Harvard. When I was there as a private assistant to Dr. Farlow there was much to interest students botanically inclined. Dr. Farlow was most helpful and kind, always ready to do something for those interested in botany. I always felt that Dr. Farlow is one of the big botanists of the country and one of the big men of Harvard. In his laboratory, as students at that time, were men who have done much for science: Parker, the zoologist; Thaxter, F. L. Sargent, Ganong, Robinson and Humphrey, the botanists. Other botanists in Harvard of the time were Gray, Watson and Goodale. Of these I shall not speak at this time. We all know of their work. Next door to us was Dr. Marx, Fewkes, Shaler, Davis and Agassiz. During these days the Cambridge Entomological Club used to meet once a month, I think. Here I met Seudder who frequently discussed the fossil cockroaches; Dimmock was another prominent entomologist. All of these men made im-

portant contributions to science. The Natural History Club was in full swing. At one of these meetings Dr. Trelease gave a lecture on 'The Pollination of Flowers.' One should catch the spirit of Harvard which is democratic in every way, to understand the wonderful impression it has made on the education of the United States.

"Of Cornell University in the days I mention, I knew nothing, except as I have gleaned from Dr. Trelease. I feel that I know something about Prentiss who trained a remarkably good lot of men, of Dudley whose painstaking work in the classes left an impression on the botany of Cornell in the early days. Then there was Comstock in entomology, Gage in histology, Anthony in physics, who was a remarkable teacher. You Cornellians all remember with pride Andrew D. White, Professor Caldwell and Professor Roberts.

"I recall many interesting things about Washington University where Dr. Trelease was the Engelmann professor of botany during the days I was there; the dingy old two-story building at 1724 Washington avenue, the lecture room downstairs and the laboratory and office upstairs, the delightful laboratory exercises in botany. Classes were not large and a most delightful part of the program were the courses given to ladies of the city who were interested in botany for the pleasure they found in the study of plants. It was here also that I met Dr. C. C. Parry who came to St. Louis from Davenport to call on Dr. Trelease who was then interested in *Ceanothus*, a genus studied by Dr. Parry. It was also a pleasure to direct Alfred Russell Wallace, the noted English naturalist, to the gardens. The thing I have most regretted is that I did not know at the time that I was talking to such a distinguished man, who had come to pay Dr. Trelease a visit. Of the men who were at the university in these days, I will mention Drs. Waterhouse, Lytton, Dean Snow, Professor Pritchett, Drs. Baumgarten and Greene of the medical department.

"Of the prominent men of the city and of especial interest to botanists, mention must be made of Henry Shaw who founded the Missouri Botanical Garden. Mr. Shaw was a delightful man to meet and to talk to. He was an old man when I met him and he loved to tell about some of the botanists and scientists he had met, especially S. F. Baird, Dr. Asa Gray and Dr. George Engelmann.

"Now I come to the last institution, the University of Illinois. For more than 30 years it has been my privilege to know something of this institution from a botanical standpoint. When I was in Harvard Dr. Farlow used to speak of the work of Dr. Burrill as being of a high order, not only because he had trained some excellent men, but because his work was excellent. Dr. Burrill was associated with another remarkable man, Dr.

Forbes, who stands in the front rank of economic entomologists. The volume of his work is not only large but splendid. The achievements of the scientific staff are a credit to any institution. In a letter Dr. Burrill wrote to me after Dr. Trelease was elected professor of botany he said, if I remember correctly, "Trelease and Stevens will make a great team."

"I have asked Dr. Trelease to give us a little glimpse of three men he has known intimately: John Muir, Dr. Asa Gray, and Thomas J. Burrill, representing the three institutions, the University of Wisconsin, Harvard University and the University of Illinois."

Dr. Trelease has had manifold and varied interests in the scientific and educational work of this country. He was one of the scientists of the old school, trained along many lines, and in every phase of his work he acquitted himself with distinction. At the time of the centenary of the birth of Charles Darwin, 1909, a series of papers was presented at the Baltimore meeting of the Botanical Society of America. Dr. Trelease was assigned the subject, "Darwin as a Naturalist: Darwin's Work on Cross Pollination in Plants" (*American Naturalist* 43:131) and said: "Charles Darwin is rated as a great man, and there are really not many today who would dispute his title to this verdict (but he did not come easily to it)." Darwin was really a philosopher. Darwin was charged with a theorizing power, his son once said, but he was always willing to have his theories proved. "This is at once the keynote to his life work and his greatness in influencing human thought." His manner of presenting conclusions is at once interesting, convincing and charming. Through it all, too, runs a thread of similar sentiments revealing the soul of the man, groping only after the truth, to whom the whole subject is as yet hidden in darkness. In this spirit he lived, worked and wrote, quite apart from success in accomplishing the direct purpose for which he worked. He succeeded to an exceptional degree in stimulating the research instinct in others, and directing it into attractive and prolific fields, seeing realized almost immediately his prediction that what had been held for trivialities might, when understood, "exalt the whole vegetable kingdom in most persons' estimation." Large as is his (Darwin's) service to botany, it is but an incident in his life-long struggle with this great mystery on the border line between the discoverable and the eternally unknowable, and in the same way what Dr. Trelease said about Darwin can be said of many other great men like Asa Gray and equally well of our good friend, Dr. Trelease. It is to find the truths about nature's wonderful laws that men like Darwin, Gray, Trelease, Farlow, Robinson and others set out to try to do.

Dr. Trelease always expresses himself tersely on any topic.

For instance, in his paper "The Evolution of a Botanist and of a Department of Botany" (Ind. Acad. Sci. 34:53), in introducing Dr. J. C. Arthur, one of Iowa State College graduates, he refers to his old home in Lowville, N. Y., where Dr. Franklin Hough, one of the fathers of forestry lived, and the son, Romeyn B. Hough.

"The early imprint and environment are important," Trelease says, speaking of Arthur. "Half a century of such privileges may work wonders in any case, but botanists are made in greater measure with such a background, other things being equal. Naturalists are not factory made; they are products of the soil and of what has been imbibed from it in early life."

The work of Dr. Trelease has been over such a wide field of botany it is hard for a general botanist to say which has had the greater influence on our thought and lives. His work may be grouped under the following heads: (1) Teacher, (2) lecturer, (3) executive, and (4) research work.

Teacher. The many hundreds of students who have had the privilege of his instruction in laboratory and class room always mention the pleasure it was to have had Dr. Trelease as an instructor. He has inspired many men and women to become teachers in our colleges and universities. Many have made important contributions to botanical science because of this early inspiration. I hope I may be pardoned for making a personal reference. It was after my first work in botany that I became interested in collecting plants. It was the example set by a worthy and inspiring teacher that got me interested. On one of the first longer botanical trips I made, I believe to Stoughton in Dane County, we collected all day then missed our train and had to walk some seven miles to another town to catch a train for Madison, but we found a lot of "fungi" and other plants. Then began a course in "cryptogamic botany." My zeal to collect lower forms of plants fairly burned and how I became interested in the pollination of flowers. I determined to make some contributions. What is true in my own case I am sure will apply to many others.

A good teacher creates an interest in the subject under consideration. This Dr. Trelease did to a very remarkable degree. I know of many of his older students who are not professional botanists, who have kept up a life-long interest in plants.

Soon after assuming the direction of the Missouri Botanical Garden, Dr. Trelease felt that Henry Shaw's plans for a course for garden pupils should be inaugurated. This course was fully outlined in the report of the Missouri Botanical Garden for 1898. The matter of arranging this course was largely

left to Dr. Trelease. He felt that the students in this garden course should be broadly trained in the plant sciences and subjects related to it.

He therefore placed in the course, botany, horticulture, forestry, landscape gardening, vegetable gardening, surveying, mycology, and vegetable physiology. It was for this reason Henry Shaw thought that scholarships should be created for these garden pupils, and in this way the Missouri Botanical Garden performed a large service for gardening and horticultural science. I am glad to note in this connection that the name of one of these early pupils, Prof. A. T. Erwin, appears in the report for 1897 as one of the four students taking this gardening course. He has made good in a large way in horticulture. Professor Erwin has given to me the following expression of this large service by Dr. Trelease:

"Someone has said that 'an institution is but the elongated shadow of its leader.' The Missouri Botanical Garden was fortunate in securing for its first director, Dr. William Trelease.

"The standing of this institution today is due in no small measure to the vision and insight of its first director. As the head of the Missouri Botanical Garden and dean of the Shaw School of Botany, Doctor Trelease was entrusted with the responsibility of outlining the courses and equipping the laboratories for the school of gardening and the instructional work covering the numerous phases of botany.

"As a member of one of the first classes to complete the garden course, it is a pleasure to testify to the high character of the instructional work given under Doctor Trelease.

"Practically all of the lectures were given by Doctor Trelease himself. We therefore had an intimate contact with our dean in a way which the student of today knows little about. His standards in the class room were high, both for his students and himself. At the beginning of each course we were presented with a syllabus, which was a definite index of the ground to be covered. Punctual in attendance, always courteous, he had a proclivity for work accurately done which his students will never forget.

"Our greatest joy was a 'hike' with Doctor Trelease. As a systematist he was in his element. The oaks, with which the Missouri flora is rich, including numerous hybrids, were his favorite pastime. In the field of botany Doctor Trelease has been an inspiring leader."

Biographical. Dr. Trelease published a fine biographical sketch of Mr. Henry Shaw, the great benefactor to botanical science. This fine paragraph gives a true estimate of the man:

"Mr. Shaw, though not a botanist, was a lover of plants for

themselves, and a firm believer of their influence in molding desirable traits in human character."

One is always interested in biographical sketches since they influence our lives in many different ways. Dr. William Trelease published a number of interesting biographical sketches. They are worth reading because of the style and the impression made on him by some of the great botanists, under whom it was his privilege to work. I know of no one, at least of the present day botanists, who could have given a better glimpse of the life of such men as Asa Gray, W. G. Farlow, George Lincoln Goodale, A. W. Chapman, Dr. Edward Lewis Sturtevant, and Henry Shaw. What a splendid estimate he has given us of two eminent American taxonomists of flowering plants, Dr. Asa Gray and Dr. A. W. Chapman.

"In the death of Prof. Asa Gray of Harvard University, which occurred January 30, shortly after the completion of his seventy-seventh year, American science loses a leader greater than any other known to the present generation. As a teacher Professor Gray was successful in imparting knowledge and in stimulating thought."

Notice, if you please, the estimate of Dr. A. W. Chapman:

"Few men have the natural inclination of so great a modesty and disposition to retirement as Dr. Chapman possessed. No name has been so familiar to the present generation of botanists as Dr. Chapman, and yet few botanists now living ever saw him."

The long and intimate friendship of Dr. Farlow and Dr. Trelease, along with Thaxter and Blakeslee, leads him to say:

"Since the death of Asa Gray, in 1887, no American botanist has been accorded quite the esteem in which Professor Farlow was held. In the history of American botany, Professor Farlow figures as the personality through whom Thallophytes started into the field of college botany."

Of Dr. Goodale, he said:

"Though I never had the privilege of studying under Professor Goodale, I came into close personal contact with him in 1880, when I went to Cambridge for graduate work with Farlow, Hagen and Mark, and it was my privilege frequently to listen to his brilliant lectures, which I never have heard surpassed in his field."

Dr. Trelease was a friend of the Hough family. "The work of R. B. Hough is unique among the manuals of trees. He has made a real contribution."

The world paid homage to Carl Von Linne, the great Swedish botanist, on the two hundredth anniversary of his birth.

"Linnaeus was great as an observer, greater in his ability to classify and bring into orderly arrangement numberless dis-

connected units, and greatest in applying to them differential names instead of leaving them dependent upon differential descriptions whenever they were referred to."

It was the pleasure of Dr. Trelease to work on several different occasions in the De Candolle herbarium at Geneva, Switzerland, and he has given a fine estimate of the family.

Dr. Trelease says, in the account of "Four Generations of Memorable Botanists," published in the *Scientific Monthly*:

"I recalled," in talking to Madame de Candolle, "that a quarter of a century earlier Casimir de Candolle, in his characteristic, quiet and polite but positive manner had turned to me, while we were dining, with the astonishing statement, 'You knew my father?' No protestation that the acquaintance was only that of neophyte asking the aid of a master could mask the fact that the response of the master was an exemplification of the kindly helpfulness shown by four generations to whom scientific assets carried the obligation of personal helpfulness." The four generations of the De Candolle botanists have stamped their personality on every phase of botany, and this sketch written by one who is familiar with many phases of botany should be read by the student.

Dr. Trelease says of Darwin:

"He does not seem to have considered himself a botanist . . . though he has opened our eyes to some of the most interesting aspects of plant physiology, baring their secrets in a masterly way, with the rough-and-ready methods and apparatus of an adept."

It seems most appropriate that Dr. Trelease should publish an interesting account of the life of Dr. Lewis Sturtevant, who was one of the early directors of the Geneva experiment station and greatly interested in the origin of cultivated plants.

Dr. Trelease said:

"As first director of the New York Experiment Station at Geneva, Dr. Sturtevant drew the broad plans on which the successful work of that establishment has been conducted, and which has served largely as models for subsequently organized agricultural stations over the country."

It is also fitting that this great collection of books, collected by Dr. Sturtevant, should be in the Missouri Botanical Garden, founded by Henry Shaw. It is likewise fitting that Dr. Trelease should prepare a fine biographical sketch of Henry Shaw, whose personality and work is indelibly connected with the botany of North America, thru the Missouri Botanical Garden, for the fine work that this institution has done is largely thru the munificence of Henry Shaw.

Lecturer. Dr. Trelease made many public addresses on a variety of subjects to general audiences, sometimes on purely botanical subjects, sometimes conservation, sometimes historical or biographical, as his sketch at Ames on Dr. Asa Gray, John Muir and Thomas J. Burrill, sometimes outlines of botanical work for colleges and universities, on the evolution of a botanist, etc. These addresses were always inspiring.

Research work. Few botanists of our time have really made more substantial contributions along as many lines than has Dr. Trelease. In a bibliography before me there are titles of nearly 250 papers covering a wide range of subjects.

Executive. His executive work began at the University of Wisconsin in 1883. I happened to be a student during that time and I know that the department, though small then, was well managed, and so regarded by the university authorities. I was with Dr. Trelease during the beginning of the administrative work of the Shaw School of Botany, Washington University, and later saw the work of Missouri Botanical Garden. The executive work was splendidly done. He laid out broad comprehensive plans for the garden. His administrative work at the University of Illinois was also of a high order, I am told by those who know about the work of the department. He is a man of quick decision; I may refer to his method of selecting men. In two cases he wrote to me asking if I knew anyone who would fit into the place at the Shaw School of Botany. I told him "Yes," and the appointments were made. In other words, he always relied on persons he knew. He seldom made a mistake. He was exact and methodical, with a right place for everything, and diplomatic.

His Interest in Special Phases of Science

It will be necessary to condense the material on special phases of botany and allied sciences. I have consulted many of his papers.

Thru the influence of Prof. J. H. Comstock, Dr. Trelease became interested in entomology. The work with Comstock on cotton insects gave him an opportunity to study insects in the south. There are occasional notes in several journals on insects, as for instance the note on the carnivorous habits of bees, in which he refers to the entomology of Kirby and Spence. He was unusually well informed on entomology, I thought, when I had a two-hour course under him at the University of Wisconsin. During his residence at Cambridge, Mass., he became affili-

ated with the Cambridge Entomological Club. Frequently while I attended the meetings in 1886, he discussed entomological problems. As retiring president on the 11th of January, 1889, he delivered an address on myrmecophilism, which was published in *Psyche*. In this he discussed the relation existing between ants and plants, the reason for the secretion of resinous, gummy or mucilaginous substances, why glands secrete sugar, and the use of extra nuptial glands in plants. He makes the suggestion that leaf cutting ants must have been more common in former geological times than now. Such problems as those pertaining to the ants that live in stems and stipules where food is provided as in *Cecropia peltata*. He also refers to seed harvest ants. Like all of his papers this contains a fine bibliography.

Phenology. Dr. Trelease seems to have been interested in the time of leafing and blooming of plants. It was a part of my interesting experience while a student at the University of Wisconsin to make such notes for him and later two other students, W. M. Perkins and H. F. Lueders, made similar observations. He discussed such interesting problems as the fall of the leaf and brittle twigs. He summarized the results in an article in *Science* from which I will quote a paragraph.

In speaking of the leisurely rambles of Gilbert White a century ago, which we no longer have, Dr. Trelease says:

"There is scarcely a lover of nature, however, closely confined to his study or laboratory, who does not listen for the first twitter of the bluebird or delight in the first bunch of violets brought by the spring, and find himself cheered by the chirp of the last robins, and flowers of the witch hazel, on the threshold of winter."

Ecology. One of the interesting phases of ecology is the pollination of flowers. Dr. Trelease early became interested in the subject through the influence of the works that Charles Darwin published while he was a student at Cornell. Dr. Trelease wrote me: "The thing that turned me to pollination interests was the series of books on that subject that Darwin was publishing then; and I suppose Severin Axell's work led me to take up Swedish as that of Delpino necessitated Italian, while Hermann Mueller kept my German fresh. These men up to the time of their death were among my warmest friends and correspondents." The earliest paper of his on pollination was published in *American Naturalist* in 1879 on *Clitoria* and *Centrosema*. This was followed by many others. An important paper published by him was "Nectar and Its Uses," in 1880, but the work was done in 1879. It was highly commended by Prof. Comstock who wrote the introduction. The paper gave a thorough compre-

hensive survey of nectar secretion and in addition many original observations were presented on the extra floral nectaries of may-pop, poinsettia, and cotton. In its broad outline the paper shows that the whole problem had been investigated. A companion and a popular account appeared in the American Bee Journal in 1880. The subject has been of interest to him for many years, for forty years later he published two papers in the American Bee Journal, "Nectar and Nectar Secretion" and "Physiology of Nectar Secretion." He says, "This is an unusual process." In this paper he comments in a popular and splendid way on nectar secretion in plants to secure cross fertilization. The paper has a short historic sketch of the subject of pollination.

A general account on pollination, "Flowers and Their Visitors," appeared in the Cornell Review in 1880 and "Fertilization of Flowers by Humming Birds" in 1880, based on notes of the flowers he observed visited by humming birds in the Southern States, namely *Passiflora incarnata*, *Aesculus parviflora*, *Lobelia cardinalis*, *Erythrina herbacea*, and the "Fertilization of *Salvia splendens* by the Humming Bird" are all excellent papers. There are several papers on heterogamy like the paper on *Oxalis Suksdorfii* and the heterogamy of *Oxalis violacea*.

In an early paper on *Calamintha*, 1881, with good figures drawn by himself, he gives an account of nectar guides; notes the nectar glands of this and other labiates. The proterandry of the flowers and the frequency of the pollinators like *Apis* and *Bombus* are noted. In another paper Trelease discusses the pollination of the European columbine. He made many observations on the perforation of flowers by insects, some of these as early as 1881. The paper by H. Mueller on the bumble bee (*Bombus mastrucatus*), a dysteleologist, interested him because of its relation to the teleological questions involved. It robs the flower only because it is unable to get the nectar in the normal way. When I observed the perforation of the flowers of *Phlomis tuberosa* and studied the pollination of this plant, I found he was perfectly familiar with the large literature of the subject. He knew about the work of Charles Darwin, that of Hermann Mueller, Delpino, and others. He could read the French and German and Italian with ease. It was stimulating to me in every part of my studies to get his helpful suggestions. Such papers as "Proterandry in *Pastinaca*" and "The Pollination of Skunk Cabbage" were real contributions on the subject of pollination.

The most important papers by Dr. Trelease on pollination are those dealing with yucca; one of the earliest of these was a study of the nectary of yucca which appeared in 1886. The studies were made soon after he removed to St. Louis. He found

no reason to doubt the accuracy of Dr. Riley's statement that the *Pronuba* gathers the pollen and places it in the stigmatic cavity. He corrects the Riley statement in regard to the position of the nectaries. They occur "within the partitions that separate the three cells of the pistil forming pockets extending nearly from the base to the summit of the ovary." The pollination of yucca is without parallel among plants and so is one of great interest to the botanist.

Other important papers published by him on yucca are "Further Studies of Yuccas and their Pollination" in 1893. This is based on the extensive field studies in the regions where the yuccas occur, by Dr. H. J. Webber and Dr. Trelease. He says: "Among the many strange things brought to light by biological studies, few equal in interest or verge so closely on the improbable as those which concern the pollination of the yuccas." For this purpose Dr. Trelease visited California, Texas, and Arizona in 1892, where intensive field studies were made. It is one of the best monographs on the pollination of the genus. Dr. Trelease also had Dr. C. V. Riley¹ bring together his notes on the pollination of yucca. Dr. C. V. Riley and George Englemann many years previous made the first notes on the pollination of yucca.

It is impossible to bring together all of the important contributions of Dr. Trelease on this subject. It seems to me one of the most important contributions Dr. Trelease made along this line was to have inspired Mr. Charles Robertson of Carlinville, Illinois, to make a study of the pollination of flowers. Mr. Robertson, modestly working on this problem for many years in the little city of Carlinville, has published an enormous amount of valuable material. He will always stand out as our leading authority on the pollination of flowers in the United States. To the investigator along this line Mr. Robertson's work will always stand out. It is classic. I have never lost my interest in this field, which began when I took a course in flower pollination at the University of Wisconsin in 1883. My own inspiration also came from Dr. Trelease.

Cryptogamic Botany. I know it is not quite good form to now use the term "cryptogamic botany," but in order to arrange the sequence of the development of his scientific work, I am going to use the term so that there may be included his work along the line of algae, bacteria, and phyto-pathology. How did Dr. Trelease happen to take up this subject of cryptogamic botany? It was a new field in the United States when he was a student at Cornell. Comparatively few persons in our country had given

¹Rep. Mo. Bot. Garden, 3:99.

the subject any consideration. Men like C. H. Peck and Dr. W. G. Farlow had done much. The pioneers, like Lewis David von Schweinitz, H. W. Ravenel, and Moses A. Curtiss, had done something earlier. No doubt his contact with Dr. W. G. Farlow gave him an insight into the wonderfully fruitful field, especially since able workers like Anton DeBary, A. B. Frank, Paul Sorauer, Max Cornu, and Rev. M. J. Berkeley had published much. I recall most distinctly an interesting course in cryptogamic botany that I took under Dr. Trelease in my sophomore year at the University of Wisconsin in the fall of 1883. It was a wonderfully instructive course. The things to be seen under the microscope inspired me to study fungi and lower forms of plants—spirogyra, diatoms, bacteria, yeasts, powdery and downy mildews, rusts, puffballs, ferns, and mosses. The course opened my eyes to a new world. I became interested so that I began to look for parasitic fungi. I collected many interesting forms at LaCrosse, Wisconsin. I collected puff balls and remember finding *Pallus impudicus*, *P. caninum*, *Crucibulum vulgare*, *Cyathus vernicosus*, *Fomes applanatus*, and a long list of parasitic species like *Sclerospora graminicola*, *Phytophthora infestans*, and *Tilletia foetens*. His "Preliminary List of Parasitic Fungi in Wisconsin," published in 1884, is indeed the very best of the early lists of parasitic fungi. He looked up with great care the synonyms and when he was in doubt, Dr. W. G. Farlow verified the determinations. It is important that he saved the specimens. More than one plant pathologist has found it necessary to refer to the specimens collected by him and others, as for instance the finding of the downy mildew of millet at LaCrosse, Wisconsin, proved important.

Plant pathology early engaged his attention, as for instance the earliest note was one on *Gymnosporangia*, published in 1881. Apple scab, which in the eighties was such a destructive disease in Wisconsin, received his attention; he noted varieties of apples most susceptible in Wisconsin; and then followed the papers on onion mold, the rose Peronospora, the spot disease of the strawberry plant, published in the second Report of the Wisconsin Agricultural Experiment Station. There followed in rapid succession papers on the wax bean fungus, 1885, grape rot, 1885, heterocismal rusts in which he refers to the work of Cornu and DeBary and then gives a list of some of the heteroecious rusts; an interesting and little known smut on *Juncus tenuis*, the *Cintractia junci*, with a reference to species of smut occurring on different species of sedges; a paper on spot disease of orchard grass, a severe disease which had hitherto not been recognized, which was published in the Report of the United States Department of Agriculture in 1886.

Dr. W. J. Beal of the Michigan Agricultural College issued a two volume work on "Grasses of North America." Dr. Beal recognized the importance of treating the parasitic fungi of forage plants and so Dr. Trelease was asked to prepare the chapter dealing with the fungi of forage plants, which he did in a splendid way. Smuts, like leaf smut of timothy, were described; also such diseases as ergot, rust, powdery and downy mildews. He recognized the enormous damage done by parasitic fungi and also the toxic action due to ergot and he supposed also corn smut might be toxic. All of his papers were copiously and splendidly illustrated, in many cases the drawings being made by himself. He never lost his interest in parasitic fungi, and in 1897 he described a new disease of cultivated palms due to *Gloeosporium* and he was the author of the "Cryptogamic Botany of Alaska," of the Harriman Expedition in 1904, assisted by many specialists, Prof. C. H. Peek, Dr. W. Evans, Dr. P. A. Saccardo, Prof. de Alton Saunders, and Clara E. Cummings. As late as 1916 he described two leaf fungi of Cyclamen, in Illinois. This paper shows his youthful contact with the subject was still fresh. A number of important mycological papers were published by him, such as "The Morels and Puffballs of Madison, Wisconsin," in 1888, the best of the early mycological contributions of Wisconsin and the only comprehensive survey of this group of plants in that state. Another Wisconsin paper on "Edible and Poisonous Mushrooms and Toadstools," was published in the Report of the Wisconsin State Horticultural Society in 1900. Then note also a later paper, "Aberrant Veil Remnants in some Edible Agarics," in 1904, as well as the "Fungi of Alaska" in the Harriman Expedition papers. I recall while a student at the University of Wisconsin that Professor F. B. Power brought in some opium to him which was covered with a fungus. Dr. Trelease immediately set about to study it. He found an *Aspergillus* and published a paper in 1886 on "A Yellow Opium Mould."

Water Bloom. Water bloom and the working of lakes during the hot summer months has for many years been an interesting question and so Dr. Trelease¹ began to study the problem in 1882, "The Working of the Madison Lakes." He found that certain blue green algae were responsible for this phenomenon, which was caused by a greenish yellow scum consisting of fleecy masses thrown ashore by the wind. I recall his thorough work on the subject and how he conferred with Dr. E. A. Birge who was then interested in the small animals and plant life of fresh water lakes. The literature, as in all of his papers, was thor-

¹Wis. Acad. 7:121.

oughly gone into. A large list of papers was consulted, like those of W. G. Farlow, Berkeley, Archer, Bornet, Cornu, Cooke, Cohn, Magnus, Lankester, etc. It is always a pleasure to look through his papers because of the thorough use of the literature. This working of the lakes was caused by *Anabaena*, *Sphaerozyga*, *Lynngbya*, *Gloetricha*, and other blue green algae.

Geology. Every student of our present flora must have some knowledge of palaeobotany to show the relation of the present flora to the past, and how it is articulated with that of the past. In studying the flora of certain groups it is necessary to know about geologic history. In a study of yucca, agave, oaks and the related genera, the mistletoes, it was necessary for Dr. Trelease to study the palaeobotany of those groups, in order to explain succession and evolution of the groups. He has presented palaeobotany in a splendid way. In his paper "Bearing of the Distribution of the Existing Flora of Central America and the Antilles on Former Land Connection," an invitation paper presented before the Geological Society of America, he was able to show that the West Indian flora is an intricate blending of plants identical with or closely related to those of South and North America with a relatively small number of endemic types. The oaks suggest that there was no land connection with North America; *Quercus* is an ancient genus dating back to the cretaceous but which has scarcely changed since the pleistocene. It is of world-wide distribution, represented in the northern hemisphere by a single species of oak related to the live oak of the Gulf Coast region from which it hardly differs. The existing American oaks may come from a single synthetic type such as the miocene, holly-oak type (*Quercus Palaeo-Ilex*) which is represented by *Q. chrysolepsis* of today. Dr. Trelease gives a list of fossil species found in North America in the cretaceous, eocene, miocene, pliocene, pleistocene, and where the species exist today as in *Quercus rubra*, *Q. velutina*, *Q. laurifolia*, *Q. chrysolepsis*, *Q. virginiana*.

Systematic Botany. It is a hard task to classify the chief interest of Dr. Trelease, but if he were asked to designate this it would, I think, be systematic botany. He has had a splendid background, the training at Cornell University and subsequently the work under Dr. Asa Gray, Dr. Sereno Watson, and then the contact with such co-workers as Drs. B. L. Robinson, N. L. Britton, J. M. Coulter, F. Coville, J. N. Rose, Edward Lee Greene, C. C. Parry, Prof. F. Lamson-Scribner, Drs. Geo. Vasey, J. K. Small, P. A. Rydberg, L. H. Bailey, Thistleton Dyer, Lt. Col. Prain, the DeCandolles, Drs. Urban, Paul Magnus, Engler, and other European botanists which gave him that broad outlook in this field, for the taxonomist must be a broadly trained man with a

big outlook. Some of the early systematic papers were published soon after he became connected with the Shaw School of Botany—"A Study of the Meadow-rues" in 1886, "A Study of the Flax Family" in 1887, also the sorrels in 1887, and that puzzling genus known as the New Jersey tea, or California lilacs or *Ceanothus*, to which Dr. C. C. Parry had given some attention, was studied in 1888, and the study of the North American hollies in 1889. Then came studies of maples, the evening primrose plants, *Boisduvalia* and *Gayophyton*, in which he gives the geographic distribution and keys for identification; a study of the sugar maples in which the bud, twig, flower, leaf, and fruit characters are given. He recognizes five types, the bush maples, vine maples, sycamore maples, soft maples, and hard maples. This paper, like others, is finely illustrated. In order to study these plants it was necessary to make extensive field trips. I remember that Dr. Trelease looked at our campus maples and pointed out how the leaves of our black maple had the tip turned down. Another interesting early paper was the one on the Missouri dogbanes. There was also published a fine paper on hickories, in which he pointed out twig, leaf, and fruit characters. He made extensive field studies. He studied our Iowa material, receiving the aid of our Iowa botanists, Shimek and myself; and what was done for Iowa, Bush, Sargent, and Gattinger did for other localities.

The taxonomy of yucca, those interesting liliaceous plants so common and typical for the desert region of southwestern United States, and one species of which reaches Iowa, were studied in great detail. The systematic papers on "Detail Illustrations of Yucca" was published in 1892. He had an opportunity to study the pollination of the Texan, Rocky Mountain, and Guatemalan yuccas in 1892. Many other papers on yuccas, one in the Report of the Missouri Botanical Garden, 1904, the yucca paper in the Standard Cyclopaedia of Horticulture, and the paper on tree yuccas in 1912. It was necessary to study these in the field, which he did in Texas, Mexico, New Mexico, Arizona, and elsewhere. These contributions have become much more valuable, because of his field work. Some of the papers refer to the economic uses in Texas, Mexico, and Arizona. An allied group, the aloes, were ably discussed in American Horticulture in 1900. The *Amaryllis* family, of which many are cultivated in greenhouses, received his attention. The agave, so common in Mexico and where they are of great importance, were closely studied in the field, laboratory, and garden. As for instance the agaves of Lower California collected by E. W. Nelson and E. A. Goldman, and the collections of H. M. Hall and T. S. Brandegee of California received his attention.

Two larger contributions in taxonomy stand out quite conspicuously, namely the paper, of 224 pages, on mistletoes (*Phoradendron*), with numerous fine illustrations, analysis of characters, the host plants origin of the genus probably in late tertiary. The paper on the American oaks published in 1924 which followed a large number of shorter papers. It should be remembered that the American oaks had previously been studied by Dr. George Englemann and Dr. C. S. Sargent, but the group as a whole had not been monographed since the DeCandolle paper in Prodrum. The American oaks have been puzzling to many botanists and certainly have been misunderstood, and to this must be added the uncertainty of the nomenclature. There are 84 oaks in the United States, and 253 in Mexico. They are divided into white oaks (*Leucobalanus*) of which 54 occur in the United States; black and red oaks (*Erythrobalanus*), of which there are 26 in the United States, and four of the ancient (*Protobalanus*) oaks. Something more than 150 new species are described in this volume and in earlier papers, showing how much a revision was needed since the publication of the papers of DeCandolle, Sargent and others. To do this work it was necessary to consult the herbaria at Geneva, Berlin, Kew, U. S. National Herbarium, Gray Herbarium, Arnold Arboretum, New York Botanical Garden, and others.

Dr. Trelease divides the oak regions as follows: Atlantic, Rocky Mountains, California, Pacific Islands, Desert, Chihuahan, W. Sierran Table, Cordilleran, East Sierran, Central American, Andean, Antilles. Most common in Mexican highlands and west Sierra Madra range.

Oaks and other papers. Chestnut holly and lobed leaved oaks from Tertiary or even Cretaceous prototypes. The existing oaks of temperate regions have developed since the breaking of this circumpolar land connection of tertiary time. The genus may have penetrated Europe by the way of the Orient in the *Cerris* and *Ilex* types. They reached America over one or more vanished Pacific land connections. *Erythrobalanus* (black oak) is more ancient than the *Leucobalanus* group (white). *Pasania* is still more modern.

The keys are admirably arranged with fine characters for the separation of species. It shows a thorough familiarity of the subject. Four hundred and twenty plates, consisting of drawings and fine photographs, add greatly to the value of the work. Six sections of oaks are recognized. The literature for each species of the six sections of oaks is quoted. There is a splendid review of the American and other literature pertaining to oaks, beginning with M. Malpighi in 1675; including M. Catesby, 1731; Linnaeus,

1753; and such authors as T. Nuttall, 1818; F. A. Michaux, 1819; A. de Candolle, 1864; Geo. Englemann, 1868; C. S. Sargent, 1884-1895, many others, and his own numerous papers. We may give in detail his method of study of a group of plants by using his own monograph. The treatment is thorough in every respect. The following divisions were used:

Study of types.

Concept of species.

Characters: Habit, bark, twigs, buds, venation, leaf, margin, petals, veining, pubescence, structure, surface, color, inflorescence, flowers, perianth, stamens, pistil, fruit.

Abnormalities: Teratology, galls, hybridity, with a list of American hybrids numbering 51, the parents being given and a name applied to the hybrid.

Taxonomy, genera of Fagaceae and subgenera of *Quercus*, relationships of groups, geographic distribution, range, regions, geologic history.

Dr. Trelease thoroughly studied the many hybrid oaks. In order to publish such an extensive monograph the author had to consult the leading herbaria of the world and for all time to come this paper will prove one of the most important taxonomic monographs on this group published in this country.

One of the most interesting of the Trelease systematic papers is the one dealing with the flora of the Azores, botanical observations on the Azores. This splendid work was done when he was given a three months leave of absence in the summer of 1894 and a shorter one during the summer of 1896. The nine Azorean islands in mid-ocean are bathed by a branch of the Gulf stream. He studied the various aspects, such as the climate and other features. He touched on the agriculture, horticulture, pollination of flowers. He found, "The endemic flora of the Azores appears to be undergoing a gradual reduction, partly because of the utilization of all available land for agricultural purposes." He found many cosmopolitan weeds. Dr. Trelease must have been busy and left little to be looked for in the way of plants. The paper of 143 pages lists not only the flowering plants but the mosses, ferns, fungi, and algae. There are many smaller taxonomic contributions on different plants, like *Epidendrum venosum* of Florida, a cristate *Pellaea*, *Furcraea*, a strangling fig tree, and others.

Dr. Trelease has long been interested in a study of the Piperaceae. His latest is a monograph on the Piperaceae of Panama, a thoroughly comprehensive paper. I am pleased therefore also to quote in this connection a letter from Dr. Arthur concerning this monograph:

"The postman recently handed me the latest contribution from the National Herbarium, which proved to be a monograph of the Piperaceae of

Panama by Dr. William Trelease. This brings to mind some of the many similar publications with which the author has enriched botanical science. It is a pleasure to recall the numerous important scientific services and the additions to scientific literature contributed by Dr. Trelease within the half century of our mutual acquaintance. Eminent as a teacher, an administrator and an investigator, and richly endowed with that best of culture which not only illuminates daily life but lends support to the advancement of knowledge into unexplored regions, a hope for his continued welfare and opportunity for study is widely cherished."

The monograph on the Panama Piperaceae was published as a contribution from the U. S. National Herbarium in the spring of 1927. This paper of Dr. Trelease lists 92 species of the pepper (*Piper*) and 44 *Peperomia*, a genus of plants closely related to *Piper*. Quite a few (43) new species are described. There are two species of the genus *Pothomorphe* and one species of the new genus *Soroerhachis*. This fine monograph is based on a collection in the U. S. National Herbarium, a collection made by Pittier, Wm. R. Maxon, Elsworth K. Phillips, C. B. Piper, and Paul C. Standley. The preface is by Dr. F. V. Coville and the introduction by Paul Standley. Dr. Trelease has splendid keys of several genera.

More than forty years ago while I was a student at the University of Wisconsin, Dr. Trelease became interested in the winter character of trees and shrubs as presented in German texts of Willkomm, Schneider, and others, but these had never been worked out for American trees and shrubs. These characters were made use of by Dr. Trelease in systematic papers on the *Leitneria*, maples and hickories, splendidly illustrated by Miss Grace E. Johnson (now Mrs. George Clifford Vieh), whose artistic skill is shown in many other figures used by Dr. Trelease. A very large amount of fine material, of illustrations and descriptions were collected but not published in book form until many years later. Dr. C. S. Sargent in the meantime in his "Sylva" made use of these characters as has Hough and many other botanists. In 1917 Dr. Trelease brought out a splendid book, "Plant Materials of Decorative Gardening," giving the usual characters, also in 1918 he published "Winter Botany" as a companion volume to "Plant Materials of Decorative Gardening," with splendid leaf scar, bud, and other winter characters emphasized in this volume of 360 pages, and two excellent keys spread over 43 pages. There are many figures and excellent descriptions of winter characters. It is without doubt the most comprehensive treatise of this character which has been published.

A number of plants are named after Dr. Trelease. One of these is *Puccinia Treleaseana*, Pazschke, a rust on *Caltha leptosepala* DC., which he collected in the Rocky Mountains. B. F. Bush named one of the larkspurs (*Delphinium Treleasei*) after him.

The botany of Missouri and the south has been greatly enriched because of the work of Bush. Bush got much of his inspiration from Dr. Trelease.

General. Dr. Trelease has been able to present general subjects in an admirable and precise way, always with a broad outlook on the subject of botany. His conception is splendid in the inaugural address of the Henry Shaw School of Botany. He said: "In its conception the new School of Botany is representative of the spirit of the nineteenth century, the hope of its founder being that it may not only advance the science of botany, but prove useful in the pursuits of practical life to which that science can be made to contribute . . . Popular education, and a development of that love of the beautiful in nature which has so long been near the heart of Mr. Shaw, in the creation and maintenance of the magnificent garden and arboretum of which every resident of this favored city is justly proud, are foremost among the objects of the new school which is to enjoy these advantages. . . . In planning educational courses in elementary botany, work of this character cannot be overlooked; yet the time that can be given to a short course in one of the sciences by undergraduate students is always limited. To best utilize that which is available is a problem that is now engaging the best thought of the most experienced men. At best, the student leaves the classroom with little knowledge; but if his time has been wisely occupied he carried with him a disciplined mind and trained hand with which it can be increased if opportunity offers."

Botanical Achievement. Address at St. Louis, Botanists' dinner as retiring president, Bot. Soc. of America (December 31, 1919), Bibliography with the paper: "I would not urge the tyro among us to become less a cytologist, less a bryologist, less a physiologist, less a bio-chemist than his greatest inspiration prompts, but I would urge him earnestly to be more a botanist, more a naturalist, more a disciple of a broad science which is strength and effectiveness and symmetry combined, all that is good of its many and diversified component parts.

"Out of the world dismemberment has come opportunity for coöperative world reorganization and reconstruction which can be made more effective in science than anything that has preceded it. The opportunity is ours."

And again in his retiring address as president of the Botanical Society of America, August 21, 1896: "Concentration is the order of the day, specialization the keynote of progressive evolution is always intimately associated with division of labor."

The opportunity of the individual should be considered. Most

active workers of today are college professors who have done their research work in the leisure time in the year's routine, or on long vacations. Opportunity for institutions lies primarily in equipment and secondarily in its use. Large herbaria, broad reference libraries, and large store of apparatus, etc., are possible only to few universities. He insists that this is dependent on the knowledge of a subject and what has been done through concentrated effort.

In a splendid Sigma Xi address at Ames, on "The Relation of Botany to Agriculture," Dr. Trelease gave a fine outline of the subject. "Without agriculture there would be no botany, without botany agriculture would be little more than empiricism, but this empiricism would contain in itself the seeds of evolutionary improvement out of which botany must inevitably grow . . . To some people the word botany is broad enough to comprise anything whatever directly concerning plants, their structure, their function, their inter-relations with one another and with environing nature, their structures or stores that we appropriate to our own uses, their response to a little protection in reseeding our own vanishing forests, their pliability under the hands of the cultivator and the breeder, in fact in anything in which the name plants or any of its synonyms or subdivisions figures."

Dr. Trelease gave a broad outlook on the science of botany, Bacteriology has broken away from botany in agricultural colleges and universities. He quotes L. H. Bailey who said: "Botany for agriculture need not be different from botany for anything else; it ought to be botany; good morphology—more of the kind Asa Gray used to teach, good physiology and personal acquaintance with plants." Trelease said, "That is botany after all, isn't it, and can agriculture dispense with botany. . . . No college class will smile at the thought that it may contain a potential Hales or Hoffmeister, a Gray or Mendel. . . . The inspiration of an enthusiastic teacher, an indefatigable investigator, an aging man who never can become encysted by age, but whose horizon," enlarged with the years, is the contribution of colleges and universities that develop it.

In an address before the American Society of Naturalists, Ithaca, New York, in 1897, he said on the subject of the "Biological Problems of Today," in a discussion of such problems as heredity, protoplasm, cell sap, "the rise of sap seems simple, a purely physical one, the conduction in the main is through tissues which are dead." We owe it chiefly to Darwin that a science of ecology has sprung into life. The study of the flora of one's backyard in a city, of his stone wall—or of the cheese-box are worth while.

Relation of the Garden and School of Botany and Scientific Work in St. Louis

The garden and school of botany in many ways represented the new scientific interest in St. Louis, but I do not wish to convey the impression that scientific work had not previously been done in St. Louis, because the St. Louis Academy of which Dr. Trelease was for many years the efficient and capable secretary was for a great many years the center of a fine scientific interest. The academy published many splendid scientific papers on a wide range of subjects by such men as Professor Francis E. Nipher on physical and meteorological subjects like refraction, evolution of the trotting horse, magnetic iron; H. S. Pritchett, formula for prediction of population, observation of the transit of Mercury; Geo. Englemann's works on American species of *Juncus*, papers on *Cuscuta*, *Gentiana*, North American firs, pines, notes on yucca, two dioecious grasses, germination of acorns, notes on agave; C. V. Riley's contributions on *Sarracenia* insects, remarks on canker worms, genus *Pronuba*, hackberry butterflies; contributions of Benjamin D. Walsh, description of North American Hymenoptera; Dr. Ludeking, post mortem detection of chloroform.

T. C. Hilgard, phyllotaxis, exposition of a natural series; B. F. Shumard, new species of *Blastoidea*, cretaceous fossils, new palaeozoic fossils, new fossils; B. F. Shumard and John Evans, new fossils; B. F. Shumard and G. C. Swallow, new fossils; A. Wizlizenus, a mastodon, meteorological observations; C. C. Parry, ascent of Pike's Peak, snow accumulation in the Rocky Mountains, and Alpine flowers; H. A. Prout, Bryozoa; John R. Gage, on the occurrence of iron ores in Missouri; G. Hambach, structure and classification of *Pentremites*; Dr. Seyffarth, the hieroglyphic tables of Pompeian, Egyptian theology; N. Holmes, "The Geological and Geographical Distribution of Man"; G. C. Broadhead, carboniferous rocks of eastern Kansas.

The botanical publications of the academy were largely by a few men like Dr. George Englemann, Dr. T. C. Hilgard, and Dr. C. C. Parry, expressing splendid work.

Students were attracted to the School of Botany and the garden because of the splendid advantages in the new equipment, the fine herbarium, and a splendid library. A new impetus was, therefore, given to botanical research along many different lines by the students and staff. Research work was the order of the day, the United States Department of Agriculture, the various State Experiment Stations laid stress on many agricultural and horticultural problems, when Dr. Trelease became the Englemann professor of botany and later director of the garden. During the incumbency of Dr. Trelease and later, his successor, Dr. Geo. T.

Moore, a large number of students were stimulated to do fine research work. The published papers in the St. Louis Academy, the annual Reports of the garden, and later the Annals and a monthly bulletin indicate an unusual activity along the lines of taxonomy, plant pathology, plant physiology, horticulture, bacteriology, entomology, economic botany, and ornithology. The monographs and papers are important contributions to North American botany, and have added much to our knowledge of the science of plants.

Dr. Trelease showed an unusual skill in his grasp of subjects undertaken by students. I recall when I was interested along the line of perforation of flowers, he said to me, "You will find a note by Hermann Mueller on the perforation of flowers, also some notes by Darwin," etc. Dr. A. L. Bakke tells me that when one of the students was working on the genus *Bidens*, Dr. Trelease went to the book shelf and pulled out some German, Italian, and French works on the subject.

In this connection I am pleased to quote from a letter of A. L. Bakke showing the knowledge of Dr. Trelease of the literature of the subject:

"From the first time that I visited the Missouri Botanical Garden immediately before entering in upon my duties as an instructor in botany at Iowa State, I was impressed by the wonderful knowledge possessed by Dr. Trelease. The following incident brings this out.

"Dr. Earl E. Sherff of the Chicago Normal College was a student at the garden while I was there. He as you know has written a monograph on the genus *Bidens* and now is working upon *Coreopsis*. Sherff and I knew each other at Elgin, Ill., where he taught science in the Elgin High School and I in the Elgin Academy. We often went on collecting trips together. It was from him that I learned that a vasculum is not an essential instrument for a systematist but that a shirt-box will be as effective. Sherff at one time had reason to consult Dr. Trelease on some phase of taxonomy which I have now forgotten. It happened to be a proposition which took some little time but he immediately sought to help Sherff out. Dr. Trelease consulted books in Italian, Latin, German, and French and appeared to be able to handle all these languages readily. Dr. Sherff was so impressed with this that he was able to pass the impression on to me so that I readily recall it to this day."

In other words Dr. Trelease was in touch with every phase of botanical work carried on under his direction. Dr. Trelease saw the necessity of good thorough work, that this work must be presented in good English, and the importance of the student's having a good background. The twenty odd volumes of the garden

reports show an enormous amount of productive work, and so every few years the contributions by the staff of the garden and school were brought together. These bibliographies were prepared by Dr. Wm. Trelease (8th and 15th Reports), C. E. Hutchings (10th Report); Laura Brown (20th Report). The latter report brought the contributions up to 513. I have made free use of this bibliography, besides consulting many of the original papers and monographs in this discussion of the contributions made by the pupils and staff. Of course good equipment and other facilities should be taken into consideration, in doing research work.

Herbarium. In the twentieth annual Report Dr. Trelease states that the herbarium consisted of 618,666 specimens; of these Dr. Trelease gave 11,000. The collection was made up of the very valuable collection of Dr. George Engelmann, Dr. A. W. Chapman, J. J. Bernhardt, Henry Eggert, J. H. Redfield, Sturtevant and Smith, Julian Reverchon, S. B. Buckley, Nicholas Riehl, S. M. Tracy, etc.

Library. Dr. Trelease found a small but splendid library which came to the garden with the Engelmann herbarium. Mr. Henry Shaw, also had purchased certain botanical works, some most valuable ones. It was necessary, however, to add greatly to the library facilities and so Dr. Trelease began the collection of material for the library of the Shaw School of Botany to which his own rich pamphlet collection was added. On assuming the directorship of the garden every attempt was made to augment the library and herbarium. He spent many hours scanning antiquarian book catalogues for old books and pamphlets. Then by gift more books were added, such as the valuable Sturtevant pre-Linnaean library, an invaluable collection of books pertaining to old botany. Most of the current periodicals, including proceedings of societies, were added to the collection. There are few libraries in the country with a finer equipment for work. Such libraries as the Gray and Harvard, Columbia University and New York Botanical Garden, the Congressional library, equal it in the possession of rare and valuable material. At any rate few libraries in the country have brought under one roof such a valuable reference library. An enormous amount of fine pamphlet material was collected. To suitably classify this material and bring it together to make it accessible to students was a big task. Dr. Trelease set about to coördinate and classify this material, modeling it in a way after the well-known outline in *Just Botanischer Jahresbericht*. He published a paper in which he gave a classification of botanical publications. It is a well thought out plan which appeared in *Science* in 1899.

Research Work of Students

I have looked over many papers published by the students of Dr. Trelease. The papers cover a wide range of subjects. They are so uniformly excellent that it is hard to make a selection. I am, therefore, listing some of the most important papers and notes so that the extent of the work may be seen. I have in many cases abbreviated the titles.

The bibliography will be found by William Trelease in the eighth and fifteenth Garden Reports, by C. E. Hutchings in the tenth Report, and by Laura Brown in the twentieth Report.

- ANDERSON, A. P. Stomata on the bud-scales of *Abies*; Comparative anatomy of the normal and diseased organs of *Abies balsamea*.
- ARZBERGER, E. G. The fungus root tubercles of *Ceanothus*, *Eleagnus*, and *Myrica cerifera*.
- BAKER, C. F. Revision of *Elephantopaeae*.
- BALL, C. R. Notes on some western willows.
- BALTHIS, F. K. *Aristolochia gigas*; Notes on succulents, *Amorphophallus Rivieri*.
- BAY, J. CHRISTIAN. The plant cell; Yeast fungi; Bibliography of American botany; What is biology; Material for a monograph of the tannoids; Spore-forming species of the genus *Saccharomyces*.
- BESSEY, E. A. The Florida Strangling Figs.
- BERGER, A. A systematic revision of the genus *Cereus*.
- BLANKINSHIP, J. W. *Plantae Lindheimerianae*.
- BUSH, B. F. North American species of *Chaerophyllum*; The Missouri Saxifragas; The North American species of *Triodia*; A new genus of grasses; The Texas *Tradescantias*; Some new Texas plants; Notes on the botany of southern swamps; Mound flora of Atchison County; Plants collected in southeastern Missouri in 1893.
- CARDOT, J. The mosses of the Azores.
- CHAMBERS, CHAS. O. Relation of algae to dissolved oxygen and carbon dioxide.
- CONARD, H. S., and H. HUS. Waterlilies and how to grow them.
- COULTER, J. M., and C. H. THOMPSON. *Cereus*.
- DANFORTH, C. H. Periodicity in *Spirogyra*.
- DIMMOCK, T. Henry Shaw.
- DRUMMOND, J. R. The literature of *Furcraea*.
- DUFFEY, J. C. Insecticides and fungicides.
- ELIOT, W. G., JR. Trimorphic flowers of *Oxalis suksdorfii*.
- ERWIN, A. T. Lawns.
- FARLOW, W. G., with WM. TRELEASE. List of works on North American fungi.
- FERGUSON, A. M. Crotons of the United States.
- GATES, R. R. Abnormalities in *Oenothera*; An analytical key to some of the segregate of *Oenothera*.
- GLATFELTER, N. M. Venation of the species of *Salix*; *Salix Wardii*; *Salix Missouriensis*; Preliminary list of higher fungi in the vicinity of St. Louis; Relations of *Salix nigra* and *Salix amygdaloides* and hybrids; Notes on *Salix longipes*.
- GRIFFITH, D. Illustrated studies in *Opuntia*—I, II, III, IV.
- GAINEY, P. L. Volatile antiseptics and soil organisms.
- GURNEY, J. Culture of cacti; Old and neglected plants for outdoor decorations.

- HARRIS, J. A. Heredity; Importance of investigations of seedling stages; Polygamy and certain floral abnormalities in *Solanum*; Germination of *Pachira*; The origin of species by mutation; Anomalous anther structures, *Cassia*; Monocotyledons and dicotyledons; Variation and correlation in the flowers of *Lagerstroemia indica*; Dehiscence of anthers by apical pores; The fruit of *Opuntia*; *Solanum rostratum* a dangerous weed; Syncarpy in *Martynia lutea*.
- HAYDEN, ADA. Algal flora of the Missouri botanical garden.
- HEDGECOCK, G. G. *Phoma* and *Phyllosticta* on the sugar beet; Three years' experience with crown gall; Wood staining fungi; Chromogenic fungi; Disease of cauliflower and cabbage caused by *Sclerotinia*; A note on *Rhizoctonia*; The relation of water content of soil to certain plants, principally mesophytes.
- HEDGECOCK, G. G., and H. METCALF. Zuckerrubenskrankheit.
- HITCHCOCK, A. S. Identification of Walter's grasses; Anthophyta and Pteridophyta of Ames; List of cryptogams collected in the Bahamas, Jamaica and Grand Cayman; List of Plants of Bahamas, etc.; A visit to the West Indies; Glandular pubescence in *Aster patens*.
- HORSFORD, F. H. Some early native flowers; Some native plants; Wild flowers around St. Louis; Bristol pond bog.
- HUS, H. An ecological cross section of the Mississippi River in the region of St. Louis; Fasciation in *Oxalis crenata* and experimental production of fasciations; Fasciations of known causes.
- DEVRIES, HUGO. Influence of man on forms of plants; Virescence of *Oxalis stricta*.
- HUTCHINGS, C. E. A list of books and papers published from the Missouri Botanical Garden; A supplementary catalogue of the Sturtevant Prelinnean library.
- IRISH, H. C. Missouri Botanical Garden and horticulture; Hardy shrubs; On ornamentals; Monograph on the genus *Capsicum*; Garden beans as esculents; The best shrubs and herbaceous plants in a farmer's lawn.
- KELLOGG, E. J. Several systematic papers on flowering plants.
- KUNKEL, LOUIS O. A study of the problem of water absorption.
- LAMSON-SCRIBNER, F. Notes on grasses of Bernhardt herbarium collected by Thaddeus Haenke.
- LIFE, A. C. An abnormal *Ambrosia*; Light and gametophyte of ferns; Vegetative structure of *Mesoglia*.
- LIVINGSTON, B. E. Evaporation and centers of plant distribution; Evaporation and plant habitats; Relation of transpiration in cacti.
- LLOYD, FRANCIS E. Embryo, seed carpel in the date of *Phoenix dactylifera*.
- LYON, H. L. Embryogeny of *Ginkgo*.
- MACKENZIE, K. K., and B. F. BUSH. New plants from Missouri; The *Lespedezas* of Missouri.
- McCLURE, G. E. Orchid collection of Missouri Botanical Garden; The history of the chrysanthemum; Garden and landscape features of the St. Louis world's fair.
- McMULLEN, J. F. The evolution of cacti.
- MISCHE, E. The *Linarias*; Orchid notes.
- MULFORD, ISABEL. A study of the Agaves of the United States.
- NORTON, J. B. S. A revision of American species of *Euphorbia*; Literature relating to effect of wind on plants; *Ricinus*; *Pachysandra*; *Mallotus*; A study of Kansas *Ustilagineae*; Notes on some plants

- of southwestern United States; The effect of wind on trees; A coloring matter found in some Boraginaceae; Joseph F. Joor; Notes on some plants chiefly southern United States.
- OHLWEILER, WILLIAM W. Density of cell-sap and freezing points of leaves.
- PAMMEL, L. H. Anatomical characters of the seeds of Leguminosae; On the seed coats of the genus Euphorbia; Histology of the caryopsis and endosperm of some grasses; On the seed and testa of some Cruciferae; Some methods in the study of mature seeds; On the pollination of *Phlomis tuberosa*, and the perforation of flowers; Weeds of southwestern Wisconsin and southeastern Minnesota; Some common thistles; Root rot of cotton; Some mildews of Illinois.
- PÉLTIER, GEO. L. Physiology and life history of a parasitic Botrytis on pepper and lettuce; Physiology and life history of a Botrytis on pepper and *Sclerotinia fuckeliana*.
- PLUMB, C. S. Edward Lewis Sturtevant.
- PRING, G. H. Cultivation of orchids; *Vanda Sanderiana*.
- REED, E. M. Colorado wild flowers; Trees in winter; The Shaw Garden library.
- REHDER, A. Synopsis of the genus *Lonicera*.
- RILEY, C. V. The *Yucca* moth and *Yucca* pollination.
- ROGERS, H. W. The value of a study of botany.
- ROSE, J. N. *Agave expatriata* and other *Agaves* flowering in the Washington Botanic Garden; *Agave Washingtonensis*.
- SACCARDO, P. A., C. H. PECK and W. TRELEASE. The fungi of Alaska.
- SALOMONSEN, C. J. (Translation by W. Trelease.) Bacteriological technology.
- SARGENT, C. S. *Crataegus* in Missouri.
- VON SCHRENCK, H. Branch cankers of *Rhododendron*; Constriction of twigs by the bag worm; Cross-tie forms and rail fastenings; Diseases of sycamore trees; Intumescences formed by chemical stimulation; timber preservation; Treated timber; Diseases of the apple tree; Sap-rot of the red gum; Sap-rot and other diseases of the red gum; Tupelo; Two diseases of red cedar; Diseases of New England conifers; Fungus diseases of forest trees; A sclerotoid disease of beech roots; A disease of *Taxodium distichum*, known as peckiness, also a similar disease of *Libocedrus decurrens* known as pin-rot; Brown rot disease of red wood; A disease of white ash; The "bluing" and the "red rot" of the western yellow pine.
- VON SCHRENK, H., and G. G. HEDGCOCK. Apple graft wrappings and crown-gall disease; Crown-gall and hairy-root diseases of the apple tree; *Peronospora parasitica* in cauliflower.
- VON SCHRENK, H., and P. SPAULDING. Bitter-rot disease of apples; The bitter-rot fungus.
- VON SCHRENK, H., and R. HILL. Seasoning timber.
- VON SCHRENK, H., and H. C. IRISH. Experiments to determine the amount of water used by crops.
- SMITH, J. G. Carnivorous plants.
- SPAULDING, P. Two fungi growing in holes made by wood-boring insects; Relation of insects to fungi; Biographical history of botany at St. Louis, Missouri; Blight disease of young conifers; Heart-rot disease of sassafras; Botrytis upon chrysanthemum; A disease of black oaks caused by *Polyporus obtusus*; Studies of lignin and cellulose.

- THOMPSON, C. H. Agaves at Missouri botanical garden; Succulent plants; Echinocereus; Epiphyllum; The species of cacti, genus Anhalonium; A revision of Lemnaceae; Ligulate Wolffias of the United States; A troublesome weed, Convolvulus arvensis; The recent tornado.
- THOMPSON, C. H., and J. M. COULTER. *Cereus*.
- TOUMEY, J. W. An undescribed Agave from Arizona.
- WEBBER, H. J. Appendix to the catalogue of the flora of Nebraska; On the antheridia of Lomentaria; Phenomena and development of fecundation; Yucca pollination; Studies on the dissemination and leaf reflection of Yucca aloifolia and other species; Spermatogenesis and fecundation of Zamia.
- WHITTEN, J. C. The spraying question; Phenological notes at the Missouri Botanical Garden, for 1892 and 1893; The best herbaceous plants; The emergence of Pronuba from the Yucca capsules.
- WIDMANN, OTTO. Summer birds of Shaw's Garden.

Outline of Garden and School Plans

Mr. Henry Shaw in the planning for the Missouri Botanical Garden had in mind a great botanical institution which would not only afford pleasure to those who loved flowers, shrubs, and trees, but at the same time would be of great service in a scientific way. He conferred with and received the advice from two eminent botanists, Dr. Asa Gray and Dr. George Englemann, in order to create a great trust fund for this purpose. The ornamental features dear to the heart of Mr. Henry Shaw were of course begun by Henry Shaw, and this work was augmented by Dr. Wm. Trelease and later by Dr. Geo. T. Moore. To increase a greater interest in the study of garden plants special features were introduced such as a rose garden, garden plants, medicinal plants, etc. For scientific purpose Dr. Trelease planned a North American flora arranged systematically. This was laid out by the Olmsteads.

When Dr. Trelease became the director, he helped to outline a policy which in a general way has been adhered to. The outlines of the policies are brought together in the eighth garden Report. The garden was to be educational, therefore, the proper labels on plants were introduced. A fireproof building to house the library, the valuable collections and the laboratories, was constructed early during the directorship of Dr. Trelease.

The important publications of the garden as stated elsewhere were the annual Reports of which twenty-three were published.

The final Report of Dr. Trelease was issued in 1912, Dr. Trelease serving as director from January 1 to May 1, 1912, Dr. Geo. T. Moore becoming director on May 1st. The scientific papers in this report had the helpful suggestions of Dr. William Trelease and Dr. Geo. T. Moore. Dr. Geo. T. Moore also ably assisted in some work done previous to 1912.

The annual Reports contained an unusually large amount of valuable material. This publication ranks with the best in the country. In addition to the editorial work of Dr. Trelease, Mr. C. E. Hutchings assisted in the editorial work of many of the later publications. Dr. Trelease did all of the work for the earlier Reports. In the fine publication, "The Collected Writings of Dr. Geo. Englemann," Dr. Trelease was ably assisted by Dr. Asa Gray. During his secretaryship of the St. Louis Academy of Science Dr. Trelease looked after the editorial work of the proceedings.

The annual garden Reports were later changed to a splendid publication, *Annals of the Missouri Botanical Garden*, the first volume appearing in 1914. The *Missouri Botanical Garden Bulletin* appeared in January, 1913, and gave popular information about plants, reports to trustees, the garden, and the School of Botany, which expanded greatly. When I went to the School of Botany as an assistant to Dr. Trelease he took care of most of the teaching, I helped a little. There were comparatively few students from the university. There were classes in beginning botany, a few advanced students like Miss Ellen Clark from Mary Institute, and Dr. H. von Schrenk and myself, and a group of St. Louis women like Mrs. Geo. O. Carpenter, Miss Prince, Mrs. Dr. Greene, and Mrs. Dr. Bumgarten, all interested in the out-of-doors and in a study of ferns and plant life in general. A little later Dr. Trelease introduced bacteriology. The physicians of St. Louis wanted a course. The leading physicians of St. Louis took this course, one of the first courses in bacteriology given in this country. Of these early instructors who took advantage of this fine opportunity I may mention Dr. A. S. Hitchcock, J. B. S. Norton, and C. H. Thompson. The work of the School of Botany soon increased and more time was given to teaching. In the early days it was elementary botany (morphology, a little physiology, cryptogamic botany, and taxonomy). The course was thorough. The lectures could not have been improved. There was always an abundance of illustrative material for these elementary students. I took armfuls of this material to Dr. Trelease, and had the pleasure of looking over his well-arranged logical lecture notes; they were amplified of course. Time came when it was necessary to expand the work. On May 1, 1912, the staff of the Missouri Botanical Garden consisted of Dr. Geo. T. Moore, plant physiologist; Hermann von Schrenk, plant pathologist; ———, research assistant; Cora J. Hogan, curator of library; Prof. Moses Craig, curator of herbarium; Henry C. Irish, superintendent; James Gurney, head gardener; John Bannes, foreman (emeritus); Adolph Jaenicke, foreman; Rufus J. Lackland; research fellows were Charles O.

Chambers, William H. Emig, L. O. Kunkel, Jacob Schramm, Mildred W. Spargo.

Many additional plants were added to the valuable herbarium. The classification of the library was accomplished. A botanical museum was started by Henry Shaw but not much was done by him. The board approved the establishment of a museum because of its great educational value. Liberal provision was made to carry on research work in the taxonomy of flowering plants and other phases of botany, as plant physiology, plant pathology, and horticulture. Provision was also made to publish monographs on various lines of botanical work, the aim being to attract students of prominence for research work and teaching the science of botany, and to establish work for garden pupils. All of this was carried out admirably.

Dr. William Trelease left his impress on the botany of North America and the world through his untiring work as an investigator, in many fields of botany, which I have tried to indicate elsewhere in this paper. As teacher he has carried his enthusiasm for the study of plants to the thousands of pupils who have been under his direction at the University of Wisconsin, Washington University, and the University of Illinois. These students, who have become technical investigators, are scattered in the United States from the Atlantic to the Pacific, in colleges and universities, in government laboratories; they are also found abroad in China, England and Canada, and elsewhere.

From the standpoint of research many important contributions were made by the students who received their inspiration in his laboratory.

It is, therefore, a pleasure to bring this material together and to present it to you, Dr. Trelease, for the notable achievements you have made. Please accept this with our heartfelt appreciation, and may you continue to carry on this fine work.

Appreciative Letters from Students and Associates

Letter from A. S. Hitchcock, Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C., January 21, 1927.

MY DEAR PROFESSOR TRELEASE:

It gives me great pleasure to join with others in a tribute of respect to you as a teacher, colleague, and friend. It is a specially happy occasion in my case because I was your assistant at one time and it is to you that I owe my start in taxonomy. From the time that I took up botany at the age of fifteen I was interested in taxonomy though I did not know it by that name. Until I came to St. Louis in 1889 I had had no training in technical taxonomy. Your influence and example gave me an insight into the methods to be used in that line of work and the unusually ample facilities at the Missouri Botanical Garden enabled me to start work under favorable conditions. It was fortunate

for me that at the outset I learned from you the necessity of going to original sources for information and the importance of accuracy in observation. You showed me how to weigh evidence, how to divest myself of preconceived notions, and how to bring together finally a well rounded record of results. Not the least important part of this training was the drill in accuracy as to details. It was not so much what you told me as what I saw you doing. Example is more powerful than precept.

I want also to congratulate you on your accomplishment in three lines. First, the group of young men that were your assistants and who in most cases are now in positions of influence in the botanical world. Second, the long series of papers in which you have recorded the results of your taxonomic work and the world-wide reputation these have gained for you. Third, the magnificent botanical institution which you built up at St. Louis, an institution that shares preëminence with only a few throughout the world.

Finally I take this opportunity of wishing that you may have before you many years of active life in which to add to our knowledge of plant classification. Because of your accumulated knowledge and experience your later years should be very productive now that you are freed from the cares incident to a professorship.

Very sincerely yours,

A. S. HITCHCOCK,

Senior Botanist in charge of Systematic Agrostology.

Letter from Howard C. Abbott, University of South Dakota.

MY DEAR DOCTOR TRELEASE:

I have learned of your retirement from the academic work which has been the center around which your long years of service to science has been built. I am sure your pen will continue to contribute to research as in the years past.

It is a pleasant memory to be among the doctorates granted while you were at the University of Illinois. Several personal interviews stand out foremost in my associations with you at Illinois, although these instances probably are forgotten among the large numbers who have come and gone from your office.

Particularly do I remember the care in preparing students for German and French examinations, which was the bugbear of graduate requirements for me. Your method of little cards, with the German word on one side and the English on the other, is most effective and I still use it at times. Again let me recall your reading some Italian for me which seemed to bear directly on my thesis.

I enjoy and cherish such memories, and hope to have an opportunity of talking with you in the future.

Cordially yours,

HOWARD C. ABBOTT,

Professor of Botany, University of South Dakota.

Letter from E. J. Angle, Lincoln, Nebraska, June 8, 1927.

MY DEAR DR. TRELEASE:

As one of your former students it affords me great pleasure to congratulate you on the long period of service you have rendered the public in various institutions with which you have been connected.

It was my good fortune to be numbered among your students at the University of Wisconsin in the early days and at a time when we were privileged to come in close contact with our teachers. Your delightful personality and scientific attitude gave me inspiration and an outlook that did much to mold my future work. My love for botany has, if

anything, deepened with the passing years and nowhere am I more happy than in the open, observing and classifying plant life.

You have enriched the world by your voluminous contributions to botany. Among the most treasured volumes in my library are the reports of the Missouri Botanical Gardens under your able direction.

As my mind travels back to the Wisconsin days, among others I think of yourself, Dr. Birge, Professor Frankenburger, Professor Allen, Professor Freeman, Professor Daniels, Professor Van Hise, only a few of whom remain. Blessings on the memory of all.

May I wish for you many years of happy productive labor? I beg to be remembered always as one of your sincere and admiring students.

Very truly yours,

E. J. ANGLE, M. D.,
Suite 407, Funke Building.

Letter from A. L. Bakke, Iowa State College, March 29, 1927.

DEAR DR. TRELEASE:

It is certainly with great pleasure that I join with your former students and colleagues in extending to you my heartiest congratulations on such a long tenure of service for the cause of botany.

Since I began to specialize in botany, I came to know you through Dr. Pammel. And then I had the pleasure of spending the summer of 1910 at the Missouri Botanical Garden where I became more familiar with the great work you were doing.

And now, not having the active administration duties to contend with, you will have more time to do a good many things you have wanted to do for some time.

We hope we may have your counsel for a good many years, and may these years be full of happiness.

Very sincerely yours,

A. L. BAKKE,
Professor Plant Physiology.

Letter from Maurie Bailey, Wabash, Indiana, March 14, 1927.

DEAR DR. TRELEASE:

I am glad to have the privilege of adding a letter to this group coming from your former students. I think anyone who has worked under your direction is very fortunate. The two years I spent at Illinois I shall always consider two of the richest and best in my life.

Your willingness to help your students impressed me greatly. No matter how interested you were in your own research you always so gladly put it aside and gave us liberally of your time. Your interest in each and every one of us was greatly appreciated. Winona and I often commented upon how, when we came from our small college, we expected to find everyone working for his own interests and no one caring whether we "sank or swam," but you and your faculty at Illinois soon put that notion entirely out of our heads. The botany department deserved the reputation it had, over the campus, of being the friendliest department on the campus and that situation was largely due to your efforts.

Personally it is impossible for me to express in words my appreciation of the help and inspiration I received from you—but I do appreciate it and shall always be grateful.

I hope you will enjoy your summer's work and find all the information you need in the Piperaceae.

Please remember me to Mrs. Trelease.

Very sincerely,

MAURIE BAILEY.

Letter from J. Christian Bay, the John Crerar Library, Chicago, Ill., February, 1927.

DEAR DR. TRELEASE:

Your retirement from active service as head of the department of botany and teacher in the University of Illinois is the occasion of these lines. It is only an occasion, however, for what I should like to say to you has been in my mind ever and again since our first meeting in 1892. You not only were kind to me then, but guided me to find a place for myself in the world—indicating in your gentle way the right course and the ideal manner of scientific activity which behooved a young man worthy of your trust and friendship. I feel that this friendship has been a constant guide and in many ways a living conscience behind much of my work; hence my heart goes out to you in the full recognition of gratitude which I have been able to manifest only by following, in my own way, the ideals derived from our personal contact.

Your fame as a scientific worker, investigator, and teacher is before all the world and will live as long as our country itself. We who know some of its details also know of its ramifications into many departments of knowledge and human activity. It is a great thing for anyone to have met such influence as yours and to know its manifestations at close range. I for myself count this one of the greatest among the many blessings that have fallen to my share in this great land of ours.

I join with your many friends and students throughout the world who now gather around you in the hope that your years of rest will be peaceful and that we may continue still for many years to receive fresh evidence of your marvelous diligence and your high and inspiring thought.

Gratefully and sincerely yours,

J. CHRISTIAN BAY.

Letter from W. S. Beach, the Pennsylvania State College, Bustleton, Pennsylvania, April 8, 1927.

MY DEAR DOCTOR TRELEASE:

At this time of your retirement from active service in teaching, I wish to express my sincere appreciation of your assistance and counsel to me during my period of study in the graduate school of the University of Illinois. I always recall my period of work under your direction as being one of unusual profit and enjoyment. You upheld a high standard of endeavor for your students and encouraged the best in them.

In the field of research you have stood as one of the great leaders. You have accomplished much in a scholarly manner, and the science of botany has been advanced a great step by your efforts.

It becomes a pleasure to join in wishing you many more days of service and happiness.

Respectfully yours,

W. S. BEACH,
Associate Professor of Plant Pathology.

Letter from Ernst A. Bessey, Michigan State College, East Lansing, Michigan, February 12, 1927.

DEAR DR. TRELEASE:

On the occasion of your retirement from active teaching it gives me very great pleasure to bear testimony to the inspiration that your work has been to me though I never had the good fortune to have been one of your many students.

From the time I first seriously started into botanical work your name has been one with which I have been very familiar, from your connection with the Missouri Botanical Garden and from your publications in systematic botany. Fortunately my father's breadth of vision was such that I received a botanical training which enabled me to appreciate work of this kind as well as work along other lines of botany. It was, therefore, a great pleasure to me to meet you when I passed through St. Louis in 1898, beginning an acquaintance which has continued with pleasure and profit on my part ever since.

I trust that your retirement from active teaching means but a larger amount of time which you can continue to devote to your scientific investigations and furthermore that you may be able to continue these for many years to come.

With kindest regards.

Very truly yours,

ERNST A. BESSEY,
Professor of Botany.

Letter from Henry L. Bolley, North Dakota Agricultural College, Fargo, North Dakota, March 22, 1927.

DEAR SIR:

Learning of your retirement from active service as botanist and teacher, I am writing to assure you of my present high regard for the very valuable services which you have for long years rendered to science through your studies, instruction, and ever helpful correspondence.

You have been a great force in aiding ambitious young men to follow the lead of their work into public service. Personally, no greater help came to me as a young man than your kindly greeting and friendly interest and advice.

Hoping you may have many years of pleasant association with those for whom and with whom you have for years worked and associated, I am,

Yours truly,

HENRY L. BOLLEY.

Letter from Melvin A. Brannon, the University of Montana, February 28, 1927.

DEAR DR. TRELEASE:

It gives me great pleasure to join the multitude of your friends who bring greetings and salutations to you at this time. You will remember, I think, that I have very particular reason for appreciating the fraternal and professional kindness which you extended to me at Woods Hole, Massachusetts. It was through your courtesies that I was privileged to occupy the room in the biological station which the Missouri Botanical Garden subscribed for during the years 1892-1893 and 1894. Had it not been for those courtesies I should have been greatly handicapped in carrying on the work which came, as you may remember, to a satisfactory conclusion.

Your work as leader in our great science of botany is so outstanding that one cannot give adequate expression of appreciation and evaluation of it. I know that as you look through the years which you have filled with fine scientific service and human kindness you must have much satisfaction in your achievements. I should like to have you know that the botanists wherever I have met them in the United States—and that means from coast to coast—have a keen and a high appreciation of you and your services in research and in teaching;

and, as I have indicated, in the more important matter of making human life rich and worth while.

With the hope that the years ahead may be many and that you will be privileged to carry on the constructive research work which you have directed so successfully during the past years of administration and teaching in various universities, I am, with my kind regards,

Sincerely yours,

MELVIN A. BRANNON, Chancellor.

Letter from Benjamin Franklin Bush, Courtney, Missouri.

MY DEAR PROFESSOR:

It is in every way fitting on your retirement from active service in botanical work that you should receive a word of appreciation from your many friends and co-workers; and it gives me great pleasure to be numbered among these.

Your name stands out prominently among the number of friends who extended assistance and advice to me at the beginning of my botanical career, when I was just beginning to work with some object in view, and I little thought at that time that I should be numbered among your many friends; and now the time has come to show my appreciation of all the little services you have rendered me in the past, and to express the hope that you have many years of active work yet before you in the pursuit of your chosen study. I had already some twenty-five years ago endeavored to show my appreciation of the man and the friend, by giving you a nameson, William Trelease Bush, who is now a fine young man; and by dedicating to you as a botanist, the very distinct species of Larkspur, *Delphinium treleasei*.

Your advice to me on this point and that point, and many others, has contributed more to make me a good collector and trained botanist than all else, and I hope that I shall have the same friendly help and advice unto the end.

Sincerely and gratefully yours,

BENJAMIN FRANKLIN BUSH.

Letter from Hamilton H. Card, Champaign, Illinois, March 29, 1927.

DEAR DR. TRELEASE:

It is indeed a pleasure to recall my undergraduate days when I was one of your students. I shall never forget the mornings in your class room, nor the goodness of you in helping me to clear up the taxonomical difficulties that came up.

Just as some of the members of the faculty feel proud that they have come under the influence of Strasburger, so I feel that I am fortunate to have had you as my teacher.

I hope that you may enjoy many more happy botanical years.

Very sincerely yours,

HAMILTON H. CARD.

Letter from Charles O. Chambers, Compton, California, March 18, 1927.

DEAR DR. TRELEASE:

Dr. Pammel of Ames, Iowa, reminds me that you retired last June. As I retired, myself, about two years earlier, I had about lost track of all botanists.

This, of course, recalls, with considerable pleasure, my years spent at Shaw's Garden, though only one of them with you. I received my fellowship from your hand. I recall the pleasant and convenient laboratory and library put at our disposal by you and under your direction. Although we students had no direct contact with you and you probably do not remember any of us (1910-11) yet we remember you.

We were constantly aware of your presence, your influence, your example of industry, punctuality, and regularity. We were aware that it was these that had provided the fine facilities which we enjoyed. I am here expressing my personal regrets at your resignation during that time.

It is now with best wishes for your health and happiness during your years of retirement, wherever they may be spent. Ill health compelled my own retirement before the usual age of retirement, but through indolence and the influence of California's mild climate I am enjoying unusual health and happiness. Incidentally, I may recommend the same change of occupation for you.

CHAS. O. CHAMBERS.

Letter from Ellen C. Clark, Charlottesville, Virginia, April 1, 1927.

MY DEAR DR. TRELEASE:

It is many years since you came to St. Louis to help Mr. Shaw realize his dream. Do you remember that one of the first things you did was to organize a class of ladies to study grasses? How enthusiastic they were as their eyes opened to the wonders of plant life! Year after year many of them kept on joining classes to learn of one kind of plant after another and life became more full of interest and pleasure when we knew something of the flora we found. Instead of Shaw's Garden being only a place to take visitors, it became a haven where one looked forward to spending one's leisure studying the marvelous plants it contained and enjoying its beauty. The unvarying courteous welcome you and all your assistants gave made one feel Shaw's Garden was meant to be used by all, and many forgot worries and gained strength to solve troublesome problems in seeing how Nature overcame difficulties. No one ever went to you with a desire to know or help others to know something about plant life that you did not give them cordial sympathy and ready help, no matter how much time or trouble it took.

But your interest did not end with helping the individual; you aided the schools in the city in developing nature study and the courses in botany. It became the custom to take the school children to watch the growing plants at all seasons and to visit the flower shows. Many schools were surrounded with beautiful grounds and the children had contests for raising flowers and vegetables. In all this your help was freely given. In Washington University botany courses enriched the curriculum and students came from a distance to study under you and take advantage of the opportunities for advanced work furnished by the herbarium, library, and growing plants at Shaw's Garden. Your reputation as a botanist spread over this continent and Europe, and your valuable contributions to science brought you honors from scientific societies and colleges.

To aid in the plans for making St. Louis beautiful, you gave freely of your time and experience, and, in carrying them out, the city has now become noted for its beauty.

I am thankful it has been my privilege to know a man who has done so much for his generation.

With grateful remembrance and best wishes for the future,

Yours sincerely,

ELLEN C. CLARK.

Letter from A. S. Colby, College of Agriculture, Urbana, Illinois, April 21, 1927.

DEAR DR. TRELEASE:

May I not take occasion upon your retirement from active participation in university administration, teaching, and research in botany to

express to you my appreciation for the opportunity I had as one of your graduate students some years ago to learn something of the wide and important field of botany and especially of the part which taxonomy plays in adequately rounding out the science.

Since taking up work in small fruit breeding here at the station I have more than ever realized the value of the mental discipline gained under your instruction and appreciated the attention one must pay to small, but nevertheless important, details in working out the solution of a problem.

I am sure that I voice the earnest hope and conviction of scores of present and former associates and students, that it is given to you to carry on for many years in your special field of research. It would seem especially appropriate that you should continue to work at Illinois where your wide experience and ripe judgment could be available for the solution of the constantly increasing numbers of problems peculiar to your special field.

Sincerely yours,

A. S. COLBY,
Associate Chief of Pomology.

Letter from John M. Coulter, Boyce Thompson Institute for Plant Research, Inc., Yonkers, New York, February 21, 1927.

MY DEAR TRELEASE:

I am very glad to join your many friends in sending you some expression of our appreciation of your long and effective devotion to botany.

You and I have long been comrades in the development of our science. Now that we are both retired from active service our habit of activity remains, and we certainly expect to continue to contribute to the progress of botany.

I want to express to you my appreciation of our many contacts in the past, which have always been stimulating, and also the hope that these contacts will continue for some time in the future.

With sincere regards and best wishes,

Yours as always,

JOHN M. COULTER.

Letter from Stanley Coulter, Conservation Commission, Indianapolis, Indiana, February 14, 1927.

MY DEAR DOCTOR:

I wish to welcome you into the noble army of the "Emeriti." You will find the off-campus world very large and very fascinating.

What I really wanted to do, however, was, at this time, to express my appreciation of your distinguished service to education, to science, and to the development of character.

It is not given to many men to make as distinguished contributions to science and at the same time to be able to impress himself so strongly upon those with whom he came in contact. Men are very rare who can impart science and character at the same time. You happen to be one of them.

I am sure that I am only one of very many who are congratulating you, not only upon your years of service, but upon the opportunity which now opens before you to do your work in your own way and at your own time, unhampered by schedules and university regulations. Knowing what this means I congratulate you from my heart.

Very sincerely yours,

STANLEY COULTER.

Letter from W. C. Croxton, University of Illinois, March 19, 1927.

DEAR PROFESSOR TRELEASE:

Seven years ago I enrolled in your classes. As a student and teacher I have had many occasions for the gratitude I now express. I wish, above all, to express my appreciation of your kindly interest, your confidence, and your counsel.

While feeling deeply my personal debt to you, I am no less mindful of the debt of humanity, and of biological workers in particular, for your many contributions to science. May your work continue in fullest measure unhampered by scheduled duties of classroom and office.

Sincerely,

W. C. CROXTON.

Letter from C. H. Danforth, Stanford University, California, February 24, 1927.

DEAR DOCTOR TRELEASE:

There are two things wholly apart from purely scientific attainments that must give those who have achieved them a special sense of gratification. One is to have participated in the creation of some permanent thing of beauty, and one is to have disseminated a spirit of kindness among one's colleagues and students. It occurs to me that in both of these respects you have been unusually successful.

When I recall St. Louis, in its finer aspects, the Missouri Botanical Garden is always an important part of the picture, and I do not recall the Garden separately from the man who so largely determined its character and was its director when I first knew it. I shall always remember most pleasantly the receptions in the chrysanthemum season, the hospitality of the home at all times, and the friendly interest and counsel during the period when I was permitted to work at the laboratory.

I shall not forget the inspiration and stimulus that I received from you directly through personal contact at the Garden, at the academy, even on the street car, and indirectly through the institution which you built up, and the elevating influence which you exerted in various organizations in the city. So I hope I may be permitted to add my felicitations to those of your professional colleagues and to wish you many years of uninterrupted work in your chosen field. But I hope that you may always continue to give, as you have so generously given in the past, of your enthusiasm and idealism for the benefit of the younger workers, to whom these things mean so much.

Very sincerely yours,

C. H. DANFORTH.

Letter from Charles W. Densuer, Boyce Thompson Institute for Plant Research, Inc., Yonkers, N. Y., March 8, 1927.

DEAR PROFESSOR TRELEASE:

With the return of March there comes near to me many recollections that I love to dream and mull over; for thirty years I have cherished memories that had their beginning with a letter you wrote to me in the month of March. At this anniversary time of your life, I wish I could find words to tell you of the happiness and satisfaction that has come to me in my work through the years since the April day in 1896 that I came to the Missouri Botanical Garden. I owe you something I can never return, for the measure you gave me then has grown with the past thirty years of my life; and all I can find to send you now are but my continued thoughts of sincere well wishes. I hope I may see you some time when you are in New York.

CHARLES W. DENSUER.

Letter from W. H. Emig, University of Pittsburgh, March 1, 1927.

DEAR DR. TRELEASE:

One of my most pleasant memories of past school work is the work I did at the Missouri Botanical Garden. I well remember our first meeting when I called one day at the M. B. G. library to obtain a book on rustic gardening. It was a holiday and you were busy in your office with one of your many research problems. But you were not too busy to find time for a friendly chat with a student then unknown to you.

One of the few note books I have of my past school work is the note book on plant taxonomy, 1911-12. I can now better appreciate the excellent arrangement and organization of this course, as carried out under your directions.

I believe that the making of the Missouri Botanical Garden the foremost center of botanical learning in the United States belongs to you. Many people in St. Louis will recall how you devoted your attention with equal thoroughness to the small and great, the practical and cultural.

I sincerely hope that you may now find more time to continue active research in plant taxonomy and that you may have many years for the enjoyment of your new and most important work.

With best wishes, I remain very truly yours,

W. H. EMIG,
Associate Professor of Botany.

Letter from A. M. Ferguson, Ferguson Seed Farms, Inc., Sherman, Texas, April 18, 1927.

DEAR DR. TRELEASE:

Thirty-one years ago, desiring advanced graduate work in botany, I sought you out at St. Louis in the Missouri Botanical Garden. Then, as a young man, I wanted a monitor and exemplar of the spirit of scientific investigation. I spent nearly two years with you.

Since then I have gone the way that opportunity and the fates picked out for me and have had contact with many men—scholars and men of power in many fields of human interest.

Dear friend, through it all, after more than a quarter of a century, it makes my heart glad to join your many friends in this expression of our esteem for Dr. Trelease—the man, the scholar, and the worthy exemplar to all in their worthy ambitions.

It must indeed be a soul satisfying feeling to know that in your ripe period of usefulness your students and friends find their hearts still looking to Dr. Trelease with a feeling of admiration and gratitude.

Your friend,

A. M. FERGUSON.

Letter from Bruce Fink, Miami University, Oxford, Ohio.

DEAR DOCTOR TRELEASE:

I have often thought about the pleasant days that I spent about the University of Illinois last spring and the large part that you had in making my stay there pleasant and profitable. Also, I have often thought of you this year with the hope that you are finding life pleasant and are finding the time to do the research that you would like to do. I remember also the times when I was at the Missouri Botanical Gardens when you were director and the help that you gave me in the work on lichens. Last of all, recall that you told me last year that all of Nylander's works were at the garden, so that I have been able to send there several times this year for references which I needed.

While I recall vividly your kindness to me in the days when you were burdened with executive work and teaching, I want to congratu-

iate you especially on the large and useful contributions which you have been able to make to botanical science. I further trust that you may be able in these days of release from many duties to contribute largely to this accumulation of helpful work.

If I can be of any assistance to you in any way at any time, it will give me very great pleasure.

Very truly yours,

BRUCE FINK,
Department of Botany.

Letter from Lisbeth Glatfelter Fish, the Home Garden Club, Denver, Colorado, April 12, 1927.

I am glad to add my tribute to the symposium about Dr. William Trelease. My father, Dr. N. M. Glatfelter, was one of the men who belonged to the earlier group of scientists associated with Dr. Trelease, and whose labors as a collector and scientific writer were materially helped by Dr. Trelease.

Dr. William Trelease has been the active spirit in executing the ideas of that grand philanthropist, Henry Shaw, who gave the magnificent gardens to St. Louis. Dr. Trelease had a vision that few have been granted. He saw possibilities for the gardens and made them actual. To the Botanical School came men from far distances to study with this profound scholar and to use the splendid equipment of the school for research work.

Dr. Trelease was most democratic in spirit—giving time and counsel to everyone who came to learn—regardless of rank or station.

Dr. Trelease has made of the Shaw Botanical Gardens an institution second to none, and all the citizens of St. Louis should be grateful.

We are glad to offer this tribute to our friend and leader.

LISBETH GLATFELTER FISH.

Letter from John H. Gabriel, Attorney, Denver, Colorado, April 3, 1927.

MY DEAR DOCTOR:

I have just learned of your retirement from the active work in which you have been so successfully and helpfully engaged for now more than forty years.

I take this opportunity of extending to you my most profound appreciation for the splendid service rendered by you to the world in general and particularly to me in the formative years of my life. The inspiration received from you in the department of botany and in the plant life of the world has remained with me in my continuous wanderings and observations of plant life. I am sure in the summer season as I have been permitted to look about in the world, you have been in the forefront of my memory; and I am furthermore sure that if the same impression was made upon the other students with whom you have come in contact, and of which fact I have no doubt, you have been blessed with the greatest appreciation by your students and with the beautiful thoughts which they have held toward you during all these years.

It is my earnest wish that many years of pleasure and contentment may be yours to enjoy the fruits of the splendid efforts you have put forth.

You will believe me,

Very sincerely yours,

JOHN H. GABRIEL.

Letter from P. L. Gainey, Kansas State Agricultural College, Manhattan, Kansas, March 19, 1927.

MY DEAR DR. TRELEASE:

Scattered about over this country, and in other countries as well, are many men that you at one time knew, but of whom, in many instances, you have possibly long since forgotten. Not one of these fellows, though, has or ever will forget you, because at some time earlier in life they, as students, were fortunate enough to have come under your influence as a teacher and there was stamped indelibly upon their plastic minds the imprint of A MAN.

Perhaps many of these men, among whom I for one am numbered, have long since forgotten most of the botanical information that you so generously imparted, but the fundamental and most valuable impressions of the master teacher are not erased by time alone. Hence, even those of us who have strayed far from the botanical paths can conjure up as vivid a picture of you—the man—the teacher—as when we were students of yours.

I think most teachers can derive a great deal of satisfaction from a knowledge of the outstanding service, as reflected in the mature judgment of their former students, they render students. In my case I would say that it was the development of self-confidence on the part of the student by having confidence placed in him. When I think of the absolutely unknown and untried student material, gathered from the four corners of the country, with which you had to deal and the responsibilities that you entrusted to them, and, to use the slang expression, got by with, it is a marvel to me. However, I think the development of self-confidence, as well as confidence in others, that such methods elicited was, to many at least, the most valuable asset derived through association with you.

There is no year in my life that I can look back upon with more pleasure or from which I derived more profit than the one spent at the Garden, 1910-11, when you were generous enough to give such fellows as Schramm, McMurrin, Anderson, Chambers, and myself keys to the Garden.

Little did we realize the opportunity that was ours and how we did desecrate it. I have often wondered if you ever realized why the harvest from your private vineyard was so scant in the summer of 1911. Since the grapes were so carefully bagged I am sure you must have realized that it could not have been due to disease, insects, or birds. I am going to drop a clue that you may follow in solving the mystery, if you are detectively inclined, but please do not incriminate your innocent informer.

"Dock" Chambers, as you will recall, was one of those innocent looking, quiet, elderly students who had spent many of the better years of his life imparting knowledge to inappreciative younger generations. When he donned his vasculum and set forth in search of his favorite *Chlorella*, one would never suspect him of bootlegging; it is possible that he might have been used as a blind. Neither would you suspect him of being up late at night helping such a fellow as Schramm (now editor of *Biological Abstracts*) and possibly others scale the wall to that forbidden fruit. The next time you see either of these fellows ask them what they were doing a-top the stone wall on Vandeventer Avenue at 1:30 A. M., July 25, 1911. I was presented with some of the most delicious grapes I have ever tasted the next day. I am quite sure that all enjoyed the unusual privileges that you made possible for us that year.

I hope in the many years to come as you look back upon your career

as a teacher you will in a measure catch the point of view of your former students and realize the high regard with which you are held, especially by that hopeless raw material, of which I was a part, out of which no one could have molded a botanist. If so, you can have no regrets or need make no apologies to yourself for your active service as a teacher. It is with the hope of better enabling you to realize this that this letter is penned.

With very best wishes for many happy years of reflection, I am, very happy to have been a former student of yours,

P. L. GAINNEY,
Professor of Bacteriology.

Letter from Richard A. Gantz, Indiana State Normal School, Muncie, Indiana, March 3, 1927.

FRIEND AND FORMER TEACHER:

If good work is a blessing, and I say it is, you have been blessed. Your contributions to botanical science while at Wisconsin University, the Botanical Gardens, and at Illinois University, the world knows.

For the personal influence during two years in Illinois University to me, I wish to express to you my sincere appreciation. It is the wish of Mrs. Gantz and myself that your good health may keep you with us many years.

Your former student and friend,

RICHARD A. GANTZ.

Letter from Frank C. Gates, Kansas State Agricultural College, Manhattan, Kansas, June 3, 1927.

DEAR PROF. TRELEASE:

Although not one of your former students, I wish to congratulate you on your botanical achievements of the past and hope that you will still have many years before you in systematic botanical work.

Very truly yours,

FRANK C. GATES,
Associate Professor of Botany.

Letter from R. R. Gates, University of London, King's College, Strand, W.C.2, March 4, 1927.

DEAR DR. TRELEASE:

I hear that you have retired from active service as head of the department of botany in the University of Illinois. I can recall many happy incidents during the years I knew you as director of the Missouri Botanical Garden. Often I wondered at the steady energy with which you continued to direct every phase of its manifold activities during the sweltering heat of summer. I have never experienced greater climatic difficulties, except on my expedition up the Amazon in 1925.

The universality of your interests, especially in systematic botany and horticulture, always impressed me, and the Missouri Botanical Garden will always remain a monument to your activities and administrative powers. You saw many dreams come true during your period as director—dreams based upon foresight, foreknowledge, and steady hard work.

Trusting that you will have many years of freedom for the advancement of botany, and with kind remembrances to Mrs. Trelease, I remain,

Yours sincerely,

R. R. GATES.

Letter from H. A. Gleason, the New York Botanical Garden, Bronx Park, New York City, March 10, 1927.

DEAR DOCTOR TRELEASE:

Although my membership in your official family was limited to two months of time, and that more than twenty years ago, it was long enough to teach me to respect and admire you for your ability as a leader and your enthusiasm as a botanist, and these feelings have been deepened through our later years of acquaintance. You gave me in 1904 my first contact with a large herbarium and an extensive botanical library, and on material borrowed from you in 1903 I began my first taxonomic research. Such things make an impression on a young botanist which is not soon forgotten.

With sincerest wishes for a continuance of your good health and botanical activity, I am,

Very truly yours,

H. A. GLEASON.

Letter from David Griffiths, U. S. Department of Agriculture, Washington, D. C., February 23, 1927.

DEAR DOCTOR TRELEASE:

It has been a long time since we have met or had correspondence, but I have watched with interest for your contributions, resolved frequently to write, had no urgent excuse, and neglected as often as I resolved.

It gives me particular pleasure now under the stimulus of a request from your associates and students to write a word of appreciation, which the strenuousness of our present-day habits so often causes us to neglect.

You have reached a milepost in your career. As I attempt now to roughly take stock of the accomplishment I marvel at the results which are plainly discernible on the printed page. That subtlety influence on the careers of others is much more potent. This cannot be evaluated by any measuring rod we have, but we all feel it and appreciate it to be in your case far above the average.

To relate a single incident: My mind reverts to my first knowledge of you when as a youngster in South Dakota you did me a fine turn before you knew of such as I. It was back in the early 90's that T. A. Williams gave me copies of two monographs—*Epilobium* and *Rumex*—and I was able to apply them. Later much more assistance came to me in many ways, but I think this little incident was of as much value as any piece of teaching I ever received and I remember it as though it were yesterday.

Your recent retirement from the head of the department I fancy will simply give an increased opportunity for still greater service. May you thoroughly enjoy it!

Very truly yours,

DAVID GRIFFITHS.

Letter from E. F. Guba, Massachusetts Agricultural College, Waltham, Massachusetts, April 6, 1927.

DEAR DOCTOR TRELEASE:

I have learned recently of your retirement from active service as professor of botany and head of the botany department of the University of Illinois. As a former student of yours in the graduate school, I wish to express my appreciation of your services to me as my teacher and adviser.

My association with you as a graduate student was principally confined to the taxonomic field. I clearly remember our weekly conference

devoted to the identification of shrubs and to the study of Rosaceae. It was in these courses that I obtained my first comprehensive understanding of the field of taxonomy.

As major adviser to me in my graduate work, I sought advice from you frequently. I recall the cheerful and willing manner in which you gave it.

Mrs. Guba, formerly Miss Georgia Lackens, shares with me this expression of appreciation of your services to us. It has always been a pleasure to both of us to think of those instructive associations with you.

Although you are no longer engaged in active teaching, your influence and contributions to science will be always a source of inspiration and help.

Sincerely yours,

E. F. GUBA,
Assistant Research Professor of Botany.

Letter from Ada Hayden, Iowa State College, Ames, Iowa, February 20, 1927.

DEAR DR. TRELEASE:

I understand that you are retiring from formal participation in teaching, and while those who have had the pleasure of association with you as students may still think of you in this relationship, we also shall be glad to think of your freedom from the demands of a routine schedule.

While the major part of my work when at the Missouri Botanical Garden was not under your immediate direction, I greatly enjoyed the association with you and your family. Your many kindnesses are recalled, your tolerance was appreciated when you and John traced my wet tracks and dripping path over the red tile floor of the library to the laboratory where I was tenderly caring for my trophies—algae which had been secured by wading in the fountain pond chin deep. The most prized experiences were the occasional though weighing conferences. The many interests and appreciations, the masterly use of an excellent vocabulary, the ever present respect for people and their personal rights regardless of race, station, or color, were attributes and qualities observed which impressed me as very desirable for any individual to cultivate. There was abroad an atmosphere which stimulated individuals toward high standards in work and personal integrity. These experiences in the year spent at the Garden made lasting impressions on an individual in a plastic period.

You may say you have retired, but in this release from official routine, I anticipate for you in the best years of life, a greater pleasure in the more deliberate fulfillment of your work under these circumstances than any yet experienced.

With best regards to Mrs. Trelease and yourself,
Sincerely,

ADA HAYDEN,
Department of Botany.

Letter from Geo. G. Hedgcock, U. S. Department of Agriculture, Bureau of Plant Industry, Washington, D. C., March 3, 1927.

DEAR PROFESSOR TRELEASE:

Many a time I "hark" back in my memory to the pleasant days spent at the Missouri Botanical Garden. I remember with pleasure the courtesy you always showed to Dr. Spaulding and me in our work. You were every ready to help us to the limit in any way you could. I largely owe my Doctor's degree to the stimulus and advice I received

from you. If you had not suggested I ought to go after it and get it before I left St. Louis, I might have procrastinated too long in making preparation for receiving it. I worked under the greatest freedom in St. Louis.

Dr. von Schrenk, whom I will always remember kindly, was of course primarily, as my directing officer, responsible for this, but on the other hand it was you that gave us the freedom of the Garden and library, and aided us in many other ways.

I have always been sorry that you did not, when publishing on the mistletoes, also publish on the genus *Arceuthobium* (*Razoumofskya*). I would have been willing to have supplied you with a large amount of material and many photographs. I presume you would not care to attempt this work now. The way is still open for some man to do it.

Your publication on *Phoradendron* was especially thorough, and will not be replaced in a century.

I look forward to the time when I can make you a short visit and talk over old times and renew our acquaintance, which has been neglected for many years. I am pleased to see how your son Sam is forging to the front. If you care to drop me a word, it will be gratefully received.

Very sincerely yours,

GEO. G. HEDGCOCK.

Letter from S. F. Hersey, Iowa State Teachers College, Cedar Falls, Iowa.

DEAR DR. TRELEASE:

I desire to extend to you my congratulations on your long period of service as a teacher, investigator and executive. It gives me great pleasure to recall the contact I had with you long ago.

As a young man just out of college I became an instructor of science in one of the preparatory schools of the Washington University. Through the Chancellor, Doctor W. S. Chaplin, I made known my interest in Botany and received a letter of introduction to you, the Director of the Missouri Botanical Garden. You very kindly gave me the privilege of studying in the office building at the Garden every Saturday. You gave me certain lines of work and I had access to the general collection of specimens and the herbarium of Doctor Engelmann.

For two years I was a weekly visitor and student, during which time I came to know you very well and to appreciate your work as a botanist. Therefore, I am now pleased to add my word of thankful appreciation for your helpful suggestions and kindly interest which I have never forgotten and which have been an inspiration to me.

Very sincerely,

S. F. HERSEY.

Letter from L. O. Howard, Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C., March 18, 1927.

DEAR WILL:

Of course I want to join in any movement to pay you respect for what you are and what you have done. You are a big man and have had a very notable career in science. I am glad to have the distinction of having been born in the same year and I am glad that I met you while we were still in our 'teens, and I am proud that you liked me and that a warm friendship has held between us for all these years.

I am sorry, however, that after that wonderful summer in Washington when we were together almost day and night (was it in 1880?) our paths diverged and that we have come together so rarely. Perhaps it is as well—perhaps we would have quarreled. Is it conceivable?

Thirty more years of productive, profitable, and pleasant life to you, old boy!

L. O. HOWARD.

Letter from H. C. Irish, Webster Groves, Missouri, March 12, 1927.

MY DEAR DR. TRELEASE:

I understand you are retiring or have retired from the responsibilities of the botanical department of the University of Illinois. It must be a relief to be free from the exacting duties such as yours have been. Your valuable contributions to science and many other activities and your great work for the Missouri Botanical Garden and the University of Illinois certainly entitle you to a long period of rest or at least leisure, wherein you may be free to continue any congenial course you may choose.

I count it a great privilege to have had the opportunity to be associated with you during a most important period of my life. The work in which I am now engaged most frequently counts for much more than it would had it not been for that experience. Through your kindness I was able to meet many distinguished persons and to visit many places that might not otherwise have been possible to see. Those contacts have led to a larger life for me as well as for many other persons.

As the events of that period are recalled, I realize that one of your great objects was to be of some helpful service to people generally and have an unselfish part in many current events. I certainly am under lasting obligations for your many favors. You delighted in doing so much more for us than we had any reason to expect. The events of those days now linger as a pleasant memory and will remain so to the end.

Hoping there still remains a long, pleasant and profitable future for you, I am,

Most sincerely,

H. C. IRISH.

Letter from A. G. Johnson, Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C., February 23, 1927.

DEAR DOCTOR TRELEASE:

The three years I spent with you at the Garden I prize very highly. It is always a joy for me to think back over them. While I realize full well that I was not sufficiently advanced in my botanical training to make the most of my opportunities there, I "soaked up" a lot of botanical information that has stood me in good stead many times. I always valued very highly your counsel in directing my studies at the university. I can remember, as if it were yesterday, your telling me once, when I was debating about what courses to take, something like this: "We older fellows know best what you young fellows ought to take." I appreciated this advice fully at the time and have never regretted having followed your suggestions.

I always appreciated also the inspiration of your buoyancy, clear vision, and patience so evident at all times while I was with you. I can remember, as if it were yesterday, when you handed me the first plant to determine. It was a *Liatris* sent in from Texas, which, of course, I had never seen before. I was much pleased to be able to determine it easily and report the species name, which I have no doubt you already knew, namely, *Liatris elegans*. However, you seemed at the time to be as much pleased as I was, if not more so, that I had named the plant correctly.

As to your numerous scientific activities and your outstanding, far-reaching attainments in each line, certainly it must be a source of very

great satisfaction to you to know that you have been able to contribute so much in so many directions.

Your life and contributions certainly have radiated and continue to radiate helpfulness in many directions. As the years pass, I appreciate more and more the three years I had the pleasure of spending with you.

With most cordial greetings to Mrs. Trelease and yourself, I am, as always,

Sincerely yours,

A. G. JOHNSON,
Office of Cereal Investigations.

Letter from L. O. Kunkel, Boyce Thompson Institute for Plant Research, Inc., Yonkers, N. Y., February 16, 1927.

DEAR DOCTOR TRELEASE:

I understand that you have retired from active service as head of the department of botany of the University of Illinois and that your friends and former students wish to take this occasion to express their gratitude to you for the help you have given them and for your services to botanical science.

You will recall that I was one of the Rufus J. Lackland fellows at the Missouri Botanical Garden during the last year you were there. Although I did not have the good fortune to become intimately acquainted with you during my stay at the Garden, your great interest in botany made a deep impression on my mind. I have not forgotten a single word of the advice you gave me relative to research. It was very good advice. I have also not forgotten in the years that have passed your great devotion to research and to the wonderful botanical library which you collected at the Missouri Botanical Garden and to which you gave so much personal attention.

I wish, therefore, to thank you for the help you gave me and to express my appreciation of your services to botany.

With best good wishes, I am,

Very truly yours,

L. O. KUNKEL.

Letter from Ernest M. R. Lamkey, 801 Washington Street, Wilmington, Delaware, April 4, 1927.

DEAR PROFESSOR TRELEASE:

The first year of your retirement from active teaching finds your professional friends raising their voices in an old-fashioned and spontaneous revival of the faith which you have inspired and will continue to inspire for many more years in the botanical world. It is no little tribute to know that as an individual you have left just as lasting an impression upon your associates as you left upon scientific botany. The writer will always find a genial eye, a companionable pipe, and an ever ready yarn inseparably woven into the fabric of his botanical knowledge. To him, you will always represent a humanizing influence active in unifying and holding intact the fragments resulting from an over-zealous resolution of botany into separate rather than component parts.

It is with great pleasure that your friends behold the unique position of an endeared one who may view in retrospect a richly active service and still be able to contemplate many more years of productive work in the quiet tranquility so justly merited.

Sincerely yours,

ERNEST M. R. LAMKEY.

Letter from C. W. Lantz, Iowa State Teachers College, Cedar Falls, Iowa, April 8, 1927.

DEAR PROFESSOR TRELEASE:

I wish to express to you at this time my appreciation for all that you have done for me as a student. I always shall remember the pleasure and profit that I received from the first one of your courses in which I was enrolled. You may have forgotten what it was. It was a course in plant pathology devoted mostly to the study of the fungi. Since then I have come to value you as a friend as well as a teacher. Your wise counsel, coming from a broad and world-wide experience, has been a source of great satisfaction to me. You always seemed to have time to stop and give one the kindly and wise advice that is so often needed. I value the personal acquaintance in a botanical way that I have had with you. You have done much to create in me the real scientific attitude and a love for botany.

It is useless for me to speak of what you have contributed to the science of botany in research. There are others that can do that far better than I. I again want to express to you my appreciation, and I shall always remember you as a friend, a cultured gentleman, and a botanist who has helped me in the formulation of my ideals as a student of science and as a man.

Very sincerely yours,

C. W. LANTZ,
Professor of Botany.

Letter from P. A. Lehenbauer, College of Agriculture, University of Nevada, Reno, Nevada, April 14, 1927.

MY DEAR DOCTOR TRELEASE:

I have only recently learned that you have retired from active service as head of the department of Botany at the University of Illinois.

Permit me at this time to express my appreciation for the kind, helpful service which you have given me while a graduate student. I have always considered myself most fortunate to have been a student with you. Your guidance, your suggestions, your advice, always gladly and kindly given, were most stimulating to me as a student, and above all, your intense and devoted interest in botany has enabled me to carry on and find in the study of plant life that inspiration and joy which you so abundantly exemplified.

The success of a teacher is largely proportional to the interest found in his field of work and the enthusiasm with which he presents it to the students. You, Dr. Trelease, possessed these two qualities to an admirable degree. To this must be added your zeal for and your interest in investigation and research. The botanical literature gives abundant evidence of the latter and your enthusiasm in this line of work was most stimulating to your students.

I trust that in the years of your retired life you may be abundantly blessed with health and happiness and I know that hosts of your former students are joining me in this wish.

Very sincerely yours,

P. A. LEHENBAUER,
Professor of Botany and Horticulture.

Letter from Burton E. Livingston, the Johns Hopkins University, Baltimore, Maryland, February 16, 1927.

DEAR DOCTOR TRELEASE:

As one who is scarcely one of your students, nor yet one of your close colleagues, but who received inspiration and encouragement from you and your work, even at a distance, may I send this note of con-

gratulation to you on the occasion of your recent completion of one phase of your life work for American botanical science? I have greatly appreciated many phases of your work. You were among the leaders when I first enlisted. It was through your invitation that I was able to accomplish the first standardization of porous-porcelain atmometers at St. Louis, in the early spring of 1907. There were thirty white cylinders in the group, on the roof of an ancient shed—you may possibly remember. That was twenty years ago, and now you have retired, to do—I hope—just what you like best, while the atmometers hold me firmly, for we now standardize and use or send away each year not thirty but thirty times thirty of these instruments.

I hope that many years of pleasant occupation and fine accomplishments may be yours.

Yours very sincerely,

BURTON E. LIVINGSTON,
Director Laboratory of Plant Physiology.

Letter from Francis E. Lloyd, McGill University, Montreal, Canada.

MY DEAR TRELEASE:

It is in every way fitting on your retirement from active service in our common discipline that you should receive a word of appreciation from your many friends and colleagues; it gives me great pleasure to be numbered among these.

Your name is one of those which stood out among the leaders when I was first trying my scientific wings. I little thought at the time that one day I should be numbered among your colleagues, and now the time has come for a formal farewell. Happily this is merely a farewell from the ranks of active teachers. Your present health and vigor give promise of many years of continued association.

Your scientific record stands for itself. What I might say about it would not add nor detract. May I, however, say to you that your friendship has been one of the real factors in my life. You may have forgotten all about the particular circumstances which I have in mind, but I recall very vividly the words of kindness and wisdom which you once gave me and which enabled me to direct my footsteps in surer paths than hitherto. This was only a palpable evidence of your genial, kindly spirit.

With highest expressions of appreciation and with best wishes for your continued activity in the field of botany, believe me,

Most faithfully yours,

FRANCIS E. LLOYD.

Letter from Kenneth K. Mackenzie, Attorney, 150 Broadway, New York, February 14, 1927.

DEAR DR. TRELEASE:

It gives me very great pleasure to unite with others interested in botany in writing to you upon your retirement from the chair of botany at the University of Illinois, to express my appreciation and regard for your botanical work.

. . . The long series of monographs which you turned out while at Missouri Botanical Garden have always been of a very helpful nature to all interested in botany.

I am hoping very much that now that you are released from active professorial duties, you will be able to continue this kind of work and produce many more papers.

With best regards.

Sincerely yours,

KENNETH K. MACKENZIE.

Letter from Ida Norton McClure, 432 Mill Street, Williamsville, New York, May 15, 1927.

DEAR DOCTOR TRELEASE:

It is more than twenty-three years since I left the Garden. My family is grown. The girls are both past twenty—the boy is almost seventeen. As I look back at those days in the library, it is with pleasure at the joys, but with regret at the wasted opportunities. Was there ever a place more ideal for work and pleasure combined? If I failed to value it rightly then, each passing year has raised it in my mind—with its books, wonderful books, as I know now—the Garden, itself—the association with the finest people in the world—and your influence pervading all.

It used to amuse me to watch the men as they came to the Botanical Garden and stayed for a few months and to see how, slowly but surely, they—unconsciously, no doubt—adopted the ways and actions and even the mannerisms of speech of the director. There is not a doubt in my mind but that they went away stamped "Trelease," as the books were marked with my stamp—"Mo. Bot. Gard." Should I care to erase the place and your influence from my mind, it would be well nigh impossible, for aside from the effect on my own character, I have always at hand one of the best copies of the original that ever came from the mold.

Probably no one has more to thank you for, and I am sure no one is more grateful for your patient teaching and your untiring efforts to keep one in the ways of wisdom. I am glad, indeed, for this opportunity to say what I have often wished I might tell you.

With best wishes for many years of sunshine and prosperity for you and yours and with kind regards to all, I am with grateful remembrance,

Yours sincerely,

IDA NORTON MCCLURE.

Letter from Lisle N. McKown, 108 Blackman Street, Harvard, Illinois, March 5, 1927.

DEAR DR. TRELEASE:

I am grateful for this opportunity to express to you my gratitude and appreciation for the help and inspiration you have given me.

Long after we have gone away from some one with whom we have had pleasant relations, certain of their characteristics stand out in our minds. It is these characteristics, together with the environment in which we knew that person, which causes a picture to come to our minds when for any of a hundred reasons we think of him.

As I am thinking of you, Dr. Trelease, I remember a man who works for the joy of working and a man who makes life more worth while for those with whom you come in contact by pointing out to them the pleasure of learning new truths and ideas.

In closing, I wish for you many healthy, happy years to work with your plants, which you told me one time is your game of golf.

Very respectfully yours,

LISLE M. MCKOWN.

Letter from Amy Weedon Moore, Almirante, Panama, April 22, 1927.

MY DEAR DR. TRELEASE:

It is an odd time of year to be acknowledging Christmas cards, but I wanted you to know how much we appreciated your little note.

Perhaps you might think that way down here in the tropics with "the world so new and all" to us that we would not think of our class room days and teachers. But we do. You gave us a wealth of touch-

stones. Every once in a while we run across something to remind us. There is one very common reminder of you—the pipers, of which there appear to be a number of varieties. Clarence said only the other day:

“I’d like to send Dr. Trelease a nice big specimen of a piper.” They make me think of the drawings I made from herbarium specimens for you.

The department boasts of a set of Bailey. This we refer to quite frequently, and it always gives me a thrill to see your name signed to some of the descriptions. It is like meeting the friend to see his name and article.

You may remember that I took the limit of botany that was allowed. I wish I could have had more taxonomy and always regretted that that which I did get was not under your tutelage.

You will laugh when I tell you that your two little books, “Winter Botany” and “Trees and Shrubs,” found their way down here. They were not exactly like snowballs in hades, but somewhat out of place. You see they had a little corner reserved in the bottom of my trunk and have accompanied me wherever I have traveled. However, last month I sent them home along with a number of other things which I found the dampness and disuse here in the tropics would spoil.

You have sowed the seeds of botany among many individuals and perhaps you can see how far your influence and inspirations have gone when the four winds bring you in news of them. Men and women will look back to your teaching with the most pleasant of memories and are glad of this opportunity to wish such a friend good health, good fortune, and to thank you for what you have given them.

Sincerely and with all best wishes,

AMY WEEDON MOORE.

Letter from Clarence E. Moore, Almirante, Panama, April 24, 1927.

MY DEAR DR. TRELEASE:

It pleases me to have this opportunity to join with many others in expressing an appreciation of your personal help and guidance in the pursuit of botanical knowledge. Of equal value with the class instruction I hold your fund of anecdotes and reminiscences of the earlier days. It is an inspiration to have made that contact with the older school of biologists.

As a plant breeder for the United Fruit Company I have wandered somewhat from your field, but I find that my training in taxonomy is going to be of vital importance in the solution of my problem. At present I am making a cytological study of reproduction in *Musa* with the end in view of reorganizing the banana breeding program.

The opportunities for botanizing here are good and I expect to find time for it soon. It will be interesting to study family characteristics in plants not represented in the temperate regions. There are several pipers here. I shall be glad to collect some of these or any other plants for you in case you happen to want them.

In conclusion, let me congratulate you on the successful completion of a long period of active and valuable service, hoping that you may now be able to pursue your special interests with greater freedom than before.

Sincerely yours,

CLARENCE E. MOORE.

Letter from George Moore, the Missouri Botanical Garden, St. Louis, Missouri, March 4, 1927.

MY DEAR DR. TRELEASE:

It goes without saying how glad I am to be able to join with others in expressing to you my sincere congratulations on your having successfully terminated one important stage of your career and entered upon what we all hope and believe to be an even more fruitful and delightful period.

Our associations while we were together at the Missouri Botanical Garden were so pleasant and I value your friendship so highly that no mere words can express my feelings toward you. I shall have to leave it to others who are much more competent than I to express their appreciation of your numerous contributions to botany. These cover such a wide field that I doubt if any one person could adequately express all that you deserve. I must content myself with being one of those who stand by and admire your industry and versatility.

With sincere congratulations and best wishes, I am,

Very truly yours,

GEORGE MOORE.

Letter from Mrs. Pauline H. Murphy, 623 Oak Street S. E., Minneapolis, Minnesota, March 21, 1927.

DEAR MR. TRELEASE:

You probably do not remember a shy girl of sixteen, Pauline Maul, in your botany class in the spring of 1881 at the U. of W.

I still have a vivid impression of your lectures on fern life, and still have my herbarium of thirty-five specimens of flowers gathered in the vicinity of Madison, mostly at Roermund's Woods, and the flowers are still worth showing. My work in botany during that year was the beginning of my love for flowers which has been a great pleasure to me during my lifetime.

I was pleased upon reading "Far and Near" by John Burroughs, to find that you were one of that Alaska expedition.

I hear that you have retired and hope you will enjoy many happy years of ease and comfort.

Your former pupil,

MRS. PAULINE H. MURPHY.

P.S.—One of the most beautiful, gorgeous sights I have ever seen or will ever see, was in the woods near White Bear Lake, St. Paul.

My husband and I went in quest of wild flowers. We found hundreds of the most gorgeous pink and white moccasins (our state flower) growing among tall ferns, the plants as tall as the ferns, the heads just rising above them. Some were double headers, some had even three heads, and so beautifully colored. We were intoxicated with the beauty of the scene.

They were so tall we had to put them into a wash-tub. Of course we did not pick all.

The cattle were turned into this paradise and now it is difficult to find a single moccasin.

Later, we found a tamarack swamp with the tall pink moccasin with a leafless stem. That woods was a paradise too, until the farmers drained the swamp.

MRS. PAULINE H. MURPHY.

Letter from J. B. Norton, College Park, Maryland, May 7, 1927.

DEAR DR. TRELEASE:

It hardly seems like over twenty-five years since I left the Botanical Garden, but I have been right here on the same job that long. I don't know whether I have left any mark on the world's affairs from having

lived in it this long, but I certainly have had a very fine time trying.

When I look back over this quarter century, as well as the more primitive quarter that preceded it, I cannot point out a period that had a greater influence on me than the years at the Garden. Not long ago I began to put up on the wall in front of my desk, little portraits that I pick up from time to time of the persons that have contributed to my make-up, like Walt Whitman's "A child went forth." I have none of you in the group yet, though I no doubt possess one in my files of great men at home, but it should have the first place.

I find myself surprised, that I continually tell something that you said or did, using that unconsciously to illustrate all kinds of questions that come up in classes, in conversation, etc.

I think that I keep up with the times pretty well for one who is already white-headed, but all the new growth from associating with young men, reading the latest books on all sorts of new questions and keeping up investigations of new questions, is built around the nucleus formed under your able guidance during those five years in St. Louis.

I hope I am not too late to join with others in expressing some of the great appreciation I have of having had that opportunity of working with you.

Very sincerely,

J. B. NORTON.

Letter from William T. Penfound, 1719 Audubon Street, New Orleans, Louisiana, March 14, 1927.

DEAR DR. TRELEASE:

We, who are in the sunny south, send greetings to all our northern friends and wish them health and happiness. I have thought often of the work I have been privileged to have with you and am writing a word of appreciation of your teaching, your example, and your service to the science of botany.

One of the best courses I have ever taken and one which has had much to do with my present interests was the course listed as botany 4d (trees and shrubs of the campus). You may remember that you chose me as your assistant although I had taken no work of such nature previously. I learned a great deal from that course and the interest created then has led to further study and the writing of the pamphlet on the trees, shrubs, and vines of the campus which is now being used by the beginning classes. Of the other courses at Illinois the course in history of botany stands out as one of profitable pleasure. Also the work that I did on the grasses, together with the help on the technique and sketches, has been of much value to me. We are using your "Winter Botany" here and I will be wanting a half dozen copies of the book "Plant Materials" for use next year. In my opinion these books have been a considerable factor in making plant study a vital subject to many who might otherwise have found it dull and uninteresting.

The taxonomic students of botany recognize your service in that field and will be pleased to see the Piperaceae in written form.

We, your students, are especially glad to know you not only as a scientist but as a teacher and friend.

Yours very cordially,

WM. T. PENFOUND.

Letter from J. P. Pillsbury, North Carolina State College, Raleigh,
North Carolina, March 7, 1927.

DEAR DR. TRELEASE:

I have often thought of writing to you for the purpose of attempting to convey to your mind something of the attitude and content of my own with regard to the place you have had in my life and work and heart through the years since I first met you in 1891 at the Botanical Garden at St. Louis. Each time I have given it up as impossible. And it is impossible now, but nevertheless I want you to know that I know and am grateful.

I remember the first time I heard your name as it was read to me by my father in connection with the announcement which came to him of vacancies to be filled in the student scholarships at the Garden. As I look back to that time, how little I thought how much of a dominating influence through example and precept and advice you were to become in shaping my lifework. Yet it was so and today I can see where various attitudes toward investigation and procedure had their beginnings under your instruction and through your example.

It was bound to be so because of the high place which you occupied in my esteem as a student and the still higher place in it to which you moved with the advancing years and my own increasing knowledge and admiration of your work and accomplishments.

Several events stand out in my mind clearly. Among them is the picture of the library room with its long table and large mirror, with Professor Whitten, Mr. Irish, and you seated about the table conducting my final examination. I also remember that at its conclusion you said, "Pillsbury, you have a remarkable memory." Another picture is that of your office at the time you helped me solve the difficulty which confronted me in 1904 and which resulted in my securing my degree at the Pennsylvania State College in 1910. I mention these two instances to show that my memory is still keen, and that I have not forgotten. I have a clear recollection of just how you looked and spoke and smiled on those occasions, which also goes to prove not so much my own sensitiveness as the high regard in which I held you. Nor shall I ever forget.

I hold it, that you were the one to open the two great doors of opportunity which have made it possible for me to be what I am, be that what it may, and I want you to know that I am profoundly grateful. I shall never cease to be grateful to you as long as life lasts.

I have ever taken great pride in the high regard everywhere expressed as to the character and standing of the Garden under your superintendency. Also, in the facts that you brought such men to it as Dr. Webber, Professor Whitten, Dr. Thompson, and others, and that I was privileged to have secured my instruction under them and you. I felt then, and know now that I "sat at the feet" of masters. Having had such privileges one *must* do his best to carry on.

As I said in the beginning of this letter, to tell you what is in my heart is impossible. I trust that your reading of this imperfect attempt to give you some inkling may convey to you the knowledge that along with the gratitude and admiration and high esteem in which I hold you there is love in my heart as well. And how I wish for you every good thing you desire!

Sincerely,

J. P. PILLSBURY,
Professor of Horticulture.

Letter from C. L. Porter, Purdue University, Lafayette, Indiana, April 20, 1927.

DEAR DOCTOR TRELEASE:

It seems to me that colleges and universities are worth while because of the men that make them so. Acquaintance with a truly great scholar is an inspiration and an intellectual stimulus. Colleges are peculiar in that they make such contacts possible. Too often even our colleges fail to provide such inspiration. I, therefore, consider myself unusually fortunate in having had you for a teacher; but more than a teacher, a prophet, who led us to see the possibilities of our science; a poet, who made beautiful that which others would only have made dull; a critic, who developed our latent possibilities and who never mistook mediocrity for genius. Above all we remember you as a friend whose sincerity we never doubted. Your influence and your example is with us still and will be handed down to future generations of students.

Respectfully,

C. L. PORTER,
Associate Professor of Botany.

Letter from Frederick B. Power, Bureau of Chemistry, U. S. Department of Agriculture, Washington, D. C., February 23, 1927.

MY DEAR DOCTOR TRELEASE:

My attention has been called to a desire on the part of your numerous friends and former students to commemorate your retirement from a long period of professional service by some written expression of their appreciation and esteem.

Although it was not my privilege to have been enrolled as one of your students, there are probably but few now living who can look back upon a longer period of friendship. The few years of our intimate association at the University of Wisconsin and our participation in the social life of that somewhat remote period, have always been for me replete with the happiest recollections.

The inestimable service that you have rendered to botanical science during all the intervening years will be a lasting memorial of your attainments, and the influence of this service will be extended through your students for many generations.

It is my earnest wish that in your retirement from academic duties you may still be granted many years for the pursuit of research and for the enjoyment of the honors that have been so widely and worthily bestowed.

With this personal expression of my affectionate regard, believe me to be,

Most cordially yours,

FREDERICK B. POWER,
Senior Chemist.

Letter from Alfred Rehder, Arnold Arboretum, Harvard University, Jamaica Plain, Massachusetts, February 21, 1927.

DEAR PROFESSOR TRELEASE:

With great pleasure I take the opportunity to express my sincere appreciation of the work you have done for American botany and horticulture and especially dendrology. Moreover, I am personally greatly indebted to you for your kind offer to accept, about twenty-five years ago, my first larger botanical paper for publication in the Reports of the Missouri Botanical Garden. The acceptance by you for publication of my synopsis of the genus *Lonicera* encouraged me greatly to

continue my botanical studies when I was still a beginner. I was particularly pleased to have my paper appear in the same publication which contained so many of your important contributions to botany, among them your monographs of yucca and agave. Also your treatments of such difficult families as Rhamnaceae, Aquifoliaceae, Celastraceae, Loranthaceae, and lately your great work on American oaks are among the most valuable contributions to American botany, as are your useful manuals like plant materials and winter botany to dendrology and horticulture.

Expressing the hope that you will be able for many years to come, free from administrative duties, to continue your botanical studies for the benefit of American science, I am,

Sincerely and gratefully yours,

ALFRED REHDER.

Letter from Henry S. Pritchett, the Carnegie Foundation for the Advancement of Teaching, 522 Fifth Avenue, New York, May 31, 1927.

MY DEAR OLD TREBONIUS:

How many years have gone since we began our good times together! The hotel d'us must have gone into commission about the middle of the eighties. It was there you carried on that research into the value of a hand having five of a kind! Then the Treleases moved out to the splendor of Shaw's Garden and became the center of professional hospitality. How good you and your wife were to me and my little boys. It all seems such a long time ago and like another life. And now nearly all our old companions have gone west, as they say down in Egypt. What do you say to having a quail shoot this autumn before we get really old? Come on now.

Affectionately,

HENRY S. PRITCHETT.

Letter from P. E. Reid, Austin College, Sherman, Texas, March 28, 1927.

MY DEAR DOCTOR TRELEASE:

Upon your retirement from a long term of activity in the field of botany, I wish to express my appreciation for what you have done for its advancement and for the opportunity of receiving a part of my training under your supervision.

Very truly yours,

P. E. REID,
Department of Biology.

Letter from Mary E. Renich, Alma College, Alma, Michigan, June 2, 1927.

DEAR DR. TRELEASE:

Word has come to me that you have retired from active service as head of the department of botany of the University of Illinois.

I appreciate to a great extent what you have contributed to the field of botany in your researches and writings the past several years and know that you are still interested in continuing this life work. I more fully appreciate what you have done for me personally in the years I was at the university and since I have left it.

I wish to thank you again for your help and inspiration to me.

Sincerely yours,

MARY E. RENICH,
Assistant Professor of Biology.

Letter from H. F. Roberts, University of Manitoba, Winnipeg, Canada, April 20, 1927.

MY DEAR DOCTOR TRELEASE:

Hearing that you have retired from active service as the head of your department at the University of Illinois, it affords me great pleasure to write you a letter of congratulation and to wish you many more years of interest and enjoyment. I always remember with the greatest gratitude your attitude toward us who were your assistants at Washington University years ago. For my own part, as a younger man, your kind and considerate management of the men who worked with you was a lesson to myself when the time came to take up responsibilities similar in character. I trust the members of your family are well and I hope that the botanical world will have still more at your hands, now that you are freed from the heavy duties and responsibilities of a department.

For myself, I came to Manitoba seven years ago, after the death of my wife, and about a year's heavy illness on my part. I found the responsibilities of a large department too heavy and my own desire to get away from old scenes led me to accept a position with Dr. Bulter. I have a very nice position indeed here, with comparatively light teaching responsibilities and a most excellent opportunity for research. I have charge of two rather important projects under the National Research Council of Canada.

Now I must close. I often think back to the rather simple days of the old Washington University and sometimes am rather dazed over the sheer flight of time—from 1899-1901 until now. Again thanking you for your very kind consideration of me as one of your once assistants, and with very kind regards and best wishes, I remain,

Very sincerely yours,

H. F. ROBERTS,
Department of Botany.

Letter from D. H. Rose, U. S. Department of Agriculture, Bureau of Plant Industry, Washington, D. C., March 7, 1927.

DEAR DOCTOR TRELEASE:

Dr. L. H. Pammel has called my attention to the fact of your retirement last June from active service as head of the department of botany at the University of Illinois. I sincerely hope this retirement does not mean that you find it necessary to cease from all work in botany.

Your contributions to the science are so numerous and important that they need no evaluation by me. I merely wish to say, heartily, that I recognize their value, and in addition that I have the most pleasant memories of my year at the Garden. My associations with you during that year were not close, but I still recall conversations between us which have left their beneficent mark on all my subsequent professional life.

With kind regards and best wishes, I am,

Sincerely yours,

D. H. ROSE,
Associate Pathologist.

Letter from J. N. Rose, Smithsonian Institution, U. S. National Museum, Washington, D. C., February 15, 1927.

MY DEAR DOCTOR TRELEASE:

Professor Pammel has just written me that he has asked your students and friends to put on record their recognition of your services to botany. I am sorry to say that I cannot qualify under the first

heading, unless it be as a student prospective. You may recall that some forty years ago I wrote to you at Madison, Wisconsin, that I wished to take my postgraduate course with you, and had been accepted by you. I did this on the recommendation of John M. Coulter, who even then stated that you were the outstanding teacher of botany in this country. This was just before you accepted the call to St. Louis and hence I was not able to qualify.

Under the second heading, however, I think I can claim to be one of your oldest and best friends; certainly one of your great admirers. We have frequently met in Washington and St. Louis, and on one occasion in New York and again in Brussels, and also in the city of Mexico.

Your contributions to horticulture and pure botany have been *very* important. What you accomplished in the Missouri Botanical Garden was certainly monumental. You laid the foundations, broad and deep, upon which a great institution can be erected, while your contributions to taxonomic botany are of the very highest.

While your retirement from the University of Illinois will be a great loss to the teaching force of the institution, yet I am quite sure that it will only increase your usefulness in other lines of botanical work.

Wishing you all kinds of success, I remain,

Yours very truly,

J. N. ROSE,

Associate Curator, Division of Plants.

Letter from Caroline Rumbold, U. S. Department of Agriculture, Bureau of Plant Industry, Forest Products Laboratory, Madison, Wisconsin, March 21, 1927.

DEAR DR. TRELEASE:

As one of your many students still plodding along the road the botanist treads I send my respectful greeting to you who have ended the dusty part of the journey. I hope you will have many years in which to work at leisure.

I have always been grateful to you, Dr. Trelease, for showing me the adventure in my profession. This realization first dawned upon me as I watched the night moths visiting the yucca blossoms shining in the moonlight in the gardens. You emphasized it when showing me the pencil sketches Dr. Engelmann had made on his prescription pad paper. It has remained one of the tangible pleasures of life, colored the gray routine of labor, and for which I acknowledge my indebtedness.

Most sincerely,

CAROLINE RUMBOLD.

Letter from Ruth W. Ryan, March 27, 1927.

DEAR DR. TRELEASE:

It has been such a long time since I have had the pleasure of writing to you, that I am availing myself of this opportunity at once.

I was not surprised to hear that you had retired from active service at the university, as I had feared that you would do so before I had taken my degree.

It must be a consolation and joy to be able to look back upon so many years of work ably done. I am happy to have had the opportunity of doing my graduate work under your careful direction. Somehow, I do not seem able to express my appreciation as I would, but I hope that this note will carry a little of my gratitude and best wishes to you.

Sincerely,

RUTH W. RYAN.

Letter from Warren A. Ruth, University of Illinois, College of Agriculture, Urbana, Illinois, February 24, 1927.

DEAR DR. TRELEASE:

I am taking this occasion to thank you for your interest in my work as a graduate student at the University of Illinois, and to state that your kindly advice was always an inspiration to me.

Very sincerely yours,

WARREN A. RUTH,
Associate Professor of Pomological Physiology.

Letter from Mildred Spargo Schramm, Biological Abstracts, University of Pennsylvania, Philadelphia, Pennsylvania, March 18, 1927.

MY DEAR DR. TRELEASE:

It gives me real pleasure to have an opportunity to express to you the gratitude which I have felt for so long, for the encouragement and help which you gave, years ago, to a young and fearful student struggling to make some small contribution through botanical research.

The winds of circumstance have driven her far afield, in some respects in a most discouraging way; but however she may meander, she always cherishes the memory of your spirit of perseverance and cheer which so greatly strengthened her in those first uncertain years.

Wishing you many happy years of study and research in earth's most richly flowering fields, I am,

Yours most sincerely,

MILDRED SPARGO SCHRAMM.

Letter from Mary Milligan Stark and Orton K. Stark, Normal Station, Natchitoches, Louisiana, April 3, 1927.

OUR DEAR DOCTOR TRELEASE:

It is not possible to express our keen and sincere appreciation of your services to us while we were studying at the University of Illinois. These services were many and paper and pen are frail means of expression. There was the inspiration to be students of botany, real students as you, yourself, are. There was the information which filled your lecture room and made us wonder at its endlessness. Finally there was the joy of association as students, assistants, and friends with a man of such fine and noble character.

While we students like to think of you as belonging to us, we know you belong to the world, to the knowledge of which you have contributed so much. Long will your name be mentioned among those men of science who have worked unceasingly and untiringly to the accomplishment of results, the accuracy and importance of which will stand the acid test of time.

Believe us, Doctor Trelease, your loyal students and sincere friends.

MARY MILLIGAN STARK.
ORTON K. STARK.

Letter from F. L. Stevens, Department of Botany, University of Illinois.

DEAR DR. TRELEASE:

It gives me great pleasure to have the opportunity to express to you my deep appreciation of your many kindnesses to me during the period of our association in the University of Illinois; for the unstinted time you have ever been ready to devote to sound counsel and advice.

I shall ever have you in mind as one of the greatest masters in botany under whom I have worked.

F. L. STEVENS,
Professor of Plant Pathology.

Letter from Gilbert L. Stout, Champaign, Illinois, March 21, 1927.

MY DEAR DOCTOR TRELEASE:

May I have this opportunity for saying that I am very happy to have had the opportunity and privilege of being honored by having been one of your students, even though it was for a very short time. I want you to know that I appreciate having been able to enjoy that privilege.

I am wishing you the best of success in whatever of your botanical work you are continuing. No doubt you are planning to add still further to your many accomplishments of the past.

As we of the younger generation, who have known your guiding hand, put from the port of commencement upon the sea of botany in the attempt to become your worthy disciples, we feel like offering for ourselves the prayer of the ancient mariner, who prayed as he put to sea: "Keep me, O, God! My boat is so small and thy ocean so wide!"

Very sincerely yours,

GILBERT L. STOUT.

Letter from Mrs. Rose Schuster Taylor, 2813 Channing Way, Berkeley, California, February 15, 1927.

DEAR DR. TRELEASE:

You may have retired from meeting classes but from active teaching you cannot cease, for it lives in your students. As an undergraduate it was a pleasure to be in your classes. The years have revealed to me that it was a privilege and a great opportunity to have had so rare a teacher. It is not the set lessons, but the atmosphere of your class room that has remained with me. I feel it now full of warmth and kindness and life. I am indebted to you for a teaching that meant growing.

Great scientists are apt to lose sight of the layman, but you belong to the least of us as well as to those who stand on the summit. When you were in the Missouri Botanical Gardens it was with some hesitancy that I sent you a specimen of a rare orchid and two specimens of puff balls. The names with a kindly letter were returned to me and I felt anew you were still my teacher. No reward or payment can offset the debt we owe to those who enrich our lives.

With grateful heart I acknowledge to you, my teacher, my debt of gratitude.

Sincerely,

ROSE SCHUSTER TAYLOR, U. W. '85.

Letter from James W. Toumey, Yale University, School of Forestry, New Haven, Connecticut, February 15, 1927.

DEAR DR. TRELEASE:

I well remember visiting the Missouri Botanical Garden, more than thirty years ago, and seeing your workshop there and going over with you some of the many researches in the plant sciences that were under way. This splendid garden owes much to your enthusiasm and your wisdom, not only in shaping its progress and development, but also in making it a foremost center for botanical research. The high quality of your organizing ability, your capacity for shaping research, your facility in original investigations, your numerous publications, your services to the University of Illinois and your leadership as a teacher in the field of botanical sciences have been potent factors in shaping the progress of the plant sciences in America.

Your retirement comes after a long period of prolific and useful work. It must be with a high sense of satisfaction that you reflect on the progress in the plant sciences during this period. Your part in

tnis progress is a great legacy to the American people. The many students who have worked with you or under you and the many botanists who have been stimulated to better efforts by your work, hail you as one of their leaders.

Very sincerely yours,

JAMES W. TOUMEY,
Professor of Silviculture.

Letter from Hermann von Schrenk, von Schrenk and Kammerer, consulting timber engineers, St. Louis, Missouri, February 14, 1927.

MY DEAR TRELEASE:

Having recently learned of your retirement from active service as head of the department of botany of the University of Illinois, I believe this to be a fitting occasion to extend greetings and best wishes.

I am sorry that although we are not very far apart geographically, I have not had the opportunity of seeing more of you in the past years. Your retirement brings to mind the long period of service to botanical science with which you have been connected. As I look back, I can think of no one to whom botanists of the country as a whole are more indebted for aid and counsel than to your good self. Speaking personally, there is no one to whom I feel a greater debt of gratitude than to yourself. It is largely due to your aid and assistance, your sympathetic understanding, and your constant encouragement that I was able to make a start and I love to think of the privilege of association with your good self in those early days. This is a good time to tell you so. Any man who has been able to inspire others as you have done, to give them that push and enthusiasm which have made their subsequent career not only possible but effective, should feel that he has done a good job. It is needless for me to speak of your own accomplishments because they speak for themselves.

I trust that your retirement will not mean any break in your activities.

With best wishes for the coming years, in which Mrs. Trelease is included,

Cordially yours,

HERMANN VON SCHRENK.

Letter from H. J. Webber, University of California, College of Agriculture, Riverside, California, February 21, 1927.

DEAR DR. TRELEASE:

It is with pleasure that I learn of the proposition on the part of your students to send greetings to you on the occasion of your retiring from active service. While I am more than pleased to send such greetings, and to express to you my enduring love and high esteem, I find myself torn by conflicting emotions. Like Joshua, I should like to command things to stop and stand still, and for the rest of my life at least remain in "status quo." As one grows old life seems to be running at break-neck speed and change is everywhere. Old men retire and young men come forward. It is the law of life and yet sad to contemplate.

Dr. Trelease, you are retiring, but my greetings are based on the hope that you are retiring merely from active office work to the more active and pleasurable pursuit of the study you love. You are among the few of the remaining botanists who have retained an interest in the natural history side of botany which, after all, is the side of greatest human interest and a side nowadays much neglected. I hope you may retain your strength and energy for many more years to delve into this side of our great science.

In your remaining active years, I take it that your retirement means you will no longer have to "jack up" such unruly student subjects as Pammel and myself, but may now drift along serenely (I hope you smoke a serene mixture) without worry. And yet you may like to know that as I look back over my rather uneventful career these "jackings up" that you gave me occasionally, which of course you have long since forgotten as of no importance, are the things that stand out in my memory as among the most important factors in my training. I should like to be back in the old herbarium and laboratory with you again working away as we worked thirty-five years ago.

Yes, dear Dr. Trelease and Mrs. Trelease, we send to you more than mere greetings. We send what no word can properly express, in love and in sweet memories of the past years. We gratefully acknowledge your kindness and helpfulness, your enduring sympathy and support. May the peace and comfort of earth and the blessings of heaven be yours and abide with you.

Yours most sincerely,

H. J. WEBBER,

Professor of Subtropical Horticulture, Director of Citrus Experiment Station.

Letter from F. F. Weinard, University of Illinois, College of Agriculture, April 16, 1927.

DEAR DR. TRELEASE:

I will always look back with a great deal of pleasure to the years, 1919-22, during which I was a member of the botany staff, University of Illinois. Mrs. Weinard expresses the same feeling in regard to her experience in a similar capacity in 1920-21.

The acquaintanceships made at the time have been a source of pleasure. We consider ourselves fortunate to have had the opportunity of working under your kindly supervision. Through the association we gained new ideals of scholarship which we feel will be of lasting value.

We gladly take this opportunity to express to you our appreciation of the help you gave us. We want to thank you also for the continued personal interest you have shown in our progress.

Very sincerely yours,

F. F. WEINARD,

Associate Floricultural Physiologist.

Letter from Winona H. Welch, Hotel Hoosier, Danville, Indiana, March 4, 1927.

DEAR PROFESSOR TRELEASE:

Another week of teaching is finished. The profession is a busy but pleasant one. Many, many times during the year I have thought of the gems of thought you gave me while working with you at the University of Illinois. One of them concerned a woman's teaching career. I am willing to admit that you were right, but I am still very happy in the class room with the students.

Since I am in the meditative mood this evening I shall mention, among others, a number of things you unconsciously impressed upon my character. Your office, desk, class room, materials of various kinds, etc., were always so neatly and systematically arranged that one could not fail to observe and profit thereby.

I also wish to tell you how much I admired your ability to think so clearly and so logically concerning the many questions we students asked you. Our efforts were so small and insignificant in comparison

with those of our great and inspiring teacher. But still more amazing and admirable was your great wealth of information concerning our questions in addition to the answer we were seeking. Very, very frequently we left your office and remarked, "How I wish I had such a store of accurate knowledge." We always went to you with the feeling that Professor Trelease would know the desired information and we always came away satisfied.

I want to confess to you, Professor Trelease, that every night I borrowed and returned the manuscripts concerning the genus, *Peperomia*, I paused just for a moment before leaving the room to look at the photographs of the De Candolle botanists. Then my heart filled with pride because I was having the opportunity to know and to work with one of their friends, to whom they had passed on many ideas. At that time another feeling came over me—one of intense desire to profit thereby and do likewise. But, Professor Trelease, I have become very discouraged in my efforts to become more like one of my favorite professors. The star is too high to reach, but it will never be so far away that the rays of inspiration cannot fall upon my efforts and my ambitions and give me strength.

Another thought creeps in and takes its place among the others. This concerns the hours we spent together in the class room. I assure you that I consider it a very great honor and privilege to have been your assistant for three semesters. It meant so much to become acquainted with your ideas, principles, and ideals, besides gaining a great amount of information.

Still another reflection: the herbarium. It is absolutely a marvelous accomplishment to have such a splendid piece of work to one's credit. We students dealing with taxonomic problems surely enjoyed the hours we spent studying the specimens, and we appreciated the ease with which each species could be located; all due to your splendid talent in systematic arrangement.

You are deserving of exceedingly great praise in connection with the quantity and quality of your contributions to botanical science. May you enjoy many more years of pleasant and productive research. You are to be highly congratulated upon becoming not only nationally but internationally known because of your research ability in plant taxonomy.

I could write for hours concerning my appreciation of the opportunities you gave me at Illinois, but you would find it tiresome, perhaps. But to be brief, I want to tell you once more that you are more than a teacher, a fatherly adviser, and an ideal; you are the fortunate possessor of a radiating personality, so characteristic of great teachers, the influence of which will never cease. Again, thanks to you for what you have been and still are to me, a student and a friend.

My very best wishes to you and Mrs. Trelease.

WINONA H. WELCH.

Letter from Sarah K. White, Launut Hotel, St. Louis, April 9, 1927.

MY DEAR DR. TRELEASE:

I hear that you are resigning from your official position in the University of Illinois, but I cannot imagine you as giving up your beloved research work in the field that you have filled so creditably all these years—indeed this can but give you more leisure to devote to your specialty.

I remember well the first time when a student at Wellesley our professor of botany invited me to go to Harvard to hear you lecture on the fertilization of orchids. Bishop Tuttle, one of the trustees of the

Missouri Botanical Garden during your administration, held you in the highest esteem and you and Mrs. Trelease were always welcome guests at his home when I was with him. I can never forget the beautiful letter you wrote me at the time of his death.

St. Louis will always hold in loving memory the great work that you did in making the Gardens so widely known by your wonderful and original research work.

May you be spared many years to carry on that work for the good of the scientific world. My kindest regards to Mrs. Trelease and believe me,

Your sincere and admiring friend,

SARAH K. WHITE.

Letter from Truman G. Yuncker, DePauw University, Greencastle, Indiana, February 24, 1927.

MY DEAR PROFESSOR TRELEASE:

It is with great pleasure that I join with others of your friends and former students in trying to express in some small way our appreciation of you as a friend, a teacher, and an investigator and seeker of truth in the field of botanical science. While I am glad to avail myself of this pleasure I find that I am wholly unable to adequately and properly express my feelings.

I believe that your retirement from active service should merit many congratulations.

First of all, I congratulate you on your well-earned release from arduous administrative and teaching duties and the freedom which you will now have to pursue your scientific investigations wherever they may lead you. I also congratulate the field of botanical science in which you are doing your research for the opportunity you now have for more extended labors. I, likewise, congratulate the university with which you are associated on the wisdom they have exhibited in releasing you from detailed administrative duties. But, most of all, I congratulate myself that I had the great good fortune of being one of your students and of gaining the inspiration which you were able to pass on to your students by precept and example as a man, teacher, and investigator. While the coming generations of students may be losing the inspiration they might have gained from you as a teacher, and the university is losing your services as an administrator as head of your department, the field of botany at large will gain because of your freedom from these duties.

That you may be spared for many more years of service and happiness is the sincere wish of

Your former student,

TRUMAN G. YUNCKER,
Department of Biology.

Letter from P. A. Young, the University of Montana, Agricultural Experiment Station, Bozeman, Montana, March 15, 1927.

DEAR PROFESSOR TRELEASE:

It gives me much pleasure to comply with the suggestion of Dr. L. H. Pammel and write a slight expression of my appreciation of your large contributions to botanical science, and your aid to me as one of your students.

Long have you been one of the leaders blazing the steep and tortuous trail of botanical progress, and the way is now well marked to the top of that respectably lofty peak called 1927. Those who classify the cultivated shrubs that grow near the trail find their journey made

easier by two little books that are good in all seasons. Those who clamber over the bewildering taxonomic rocks near the top of this peak are cheered and guided by some mile posts label *Agave*, *Phoradendron*, *Quercus*, and *Piper*. These encyclopedic organizations of old knowledge greatly increased by new information bring understanding of these groups pleasingly close to completeness. These monumental works show in quality the perspicacious, careful, rapid, tireless work of the builder. Each structure is a corner-stone of fame with which a botanist might well be contended. As a builder of mile posts, you have taught the botanical world many things. It will not forget.

But all your achievement is not concrete and measurable in terms of thousands of pages of recorded knowledge. As a keen philosopher and teacher you inspired very many students and associates and taught them many things that cannot be adequately expressed in books. You have demonstrated the value of giving six years' work to each research problem. I have not forgotten your discussion concerning the possibility of skimming the cream in research and the value of theories. In the class room and in office conferences, you taught me much about philosophy and the fundamental concepts of botany. I would like to thank you again for much good advice, and for the hours that you spent in telling me the names of the many flowering plants that I collected in southern Illinois. I will not forget.

Your numerous students and other friends hope that, in the remaining years of useful work, you will build more mile posts and, aided by the visions you have seen from the peaks of botanical achievement, you will point out where new trails should lead.

Yours sincerely,

P. A. YOUNG,
Research Plant Pathologist.

Letter from Susan M. Williamson, The Carolina, Summerville, South Carolina, March 6, 1927.

MY DEAR DR. TRELEASE:

The pleasant, busy days passed in your classes at U. W. have been brought to mind recently by meeting here, Mr. and Mrs. Edmund Hamilton Sears of St. Louis, and by reading Mr. Rise's book, "The Glory of the Carolina Coast," in which your name was mentioned in connection with the yuccas. It was quite like renewing the old acquaintance and I much enjoyed talking of the work of long ago, only regretting that the meeting was with your name and not yourself.

I still keep my interest in the flowers and trees and try to make new friends among them.

With kind regards and many memories,

Sincerely,

SUSAN M. WILLIAMSON.

Letter from L. H. Pammel, Department of Botany, Iowa State College, Ames, Iowa, September 8, 1927.

DEAR DR. WILLIAM TRELEASE:

Forty-two years ago last June I was recommended for a degree as a special honor student in the Department of Botany of the University of Wisconsin. For four years I tried to be a faithful student, going through the intricacies of beginning work in botany when I was a freshman, following this up with work in ecology, cryptogamic and taxonomic botany. It is certainly a pleasure to recall how thoroughly familiar you were with every phase of the subject of botany and how

you inspired your students to work with a master in taking up the different phases of the subject of botany.

I recall now with a great deal of pleasure the numerous field trips we made in the vicinity of Madison, Wisconsin, to study not only the native flowering plants but the lower flowering forms as well. It is a pleasure, also, to recall now the many pleasant evenings spent in your home with Mrs. William Trelease, talking over subjects of mutual interest to you and the students. I recall with pleasure a discussion of Haeckel's *Ceylon*, and parts of the work of Belt, "*Naturalist in the Nicaragua*," and Bates, "*The Naturalist on the River Amazon*," and books of that type. I enjoyed and appreciated this contact as well as the contact with you in the laboratory and lecture room. You were always concise, exact, and methodical.

Subsequently I enjoyed my contact with you at the Henry Shaw School of Botany, Washington University, and the Missouri Botanical Garden. The wonderful grasp you had on the subject of botany appealed to me, your methods of delving into the subject, especially the orderly way in which you worked up a problem. I came to appreciate not only your greatness as a teacher but as an executive as well, and as a man who has been able to do a large amount of constructive research work. What I have done in botany I owe to you, a raw country boy who worked with you at Madison and completed his work for the doctor's degree at Washington University. Your kindly suggestions and pleasing manners helped me in a thousand ways. Your taxonomic work stands out like that of Asa Gray, A. de Candolle and Sir Joseph Dalton Hooker. You have had a breadth of vision equalled by few botanists.

I want to be remembered to you and to Mrs. Trelease for the kindness shown me during all these years. Mrs. Pammel joins me in also wishing to you and Mrs. Trelease our kindest regards.

Yours sincerely,

L. H. PAMMEL.

BIBLIOGRAPHY

SEQUENCE

Addresses
Morphology
Phenology
Pollination
Systematic, etc.
 Cryptogams
 Spermatophytes

FAMILIES

Biographic
Bibliographic
Miscellaneous
Reports
Reviews

BIOGRAPHIC DATA

St. Louis Globe-Democrat. Feb. 20, 1912, p. 1.
American Biography. 3:116.
Cattell's Amer. Men of Science.
Who's Who in America.

ADDRESSES

Inaugural address. 1885. 1890. (Henry Shaw School of Botany.
 Inaugural exercises. 6-23. Ann. Rep. Mo. Bot. Gard. 1:63-83).
Botanical opportunity. 1896. (Science, n.s. 4:367-382. Bot. Gaz.
 22:193-217. Smithsonian Rep. 1897:519-536).
The biological problems of today—Botany. 1898. (Science, n.s.
 7:147-150).
Some twentieth century problems. 1900. (Proc. Amer. Ass. Adv. Sci.
 49:[1-24]).
Producer, distributor, consumer. 1917. (Trans. Ill. Acad. Sci.
 10:37-47).
Botanical achievement. 1920. (Science, n.s. 51:121-131).
The survival of the unlike. 1920. (Science, n.s. 51:599-605).
The relation of botany to agriculture. 1924. (Science, n.s. 60:89-94).

MORPHOLOGY, ETC.

Poulsen, Botanical microchemistry. 1883. Translation from German
 edition.
Teratological notes. 1880, 1882. (Bull. Torr. Bot. Cl. 7:97-8;
 9:102-103).
An unusual phyto-bezoar. 1897. (Trans. Acad. Sci. St. Louis.
 7:493-497; pl. 40; Pharm. Rev. 16:66-70).
(Gigantic cactus monstrosity from Mexico). 1899. (Trans. Acad. Sci.
 St. Louis. 9:xx:xxi).
Two new terms. Cormophytaster and Xeniophyte, axiomatically
 fundamental in botany. 1916. (Proc. Amer. Philos. Soc. 55:237).

PHENOLOGY

When the leaves appear. 1884. (Ann. Rep. Wisc. Agr. Exper. Sta.
 1:56-73).

When the leaves appear and fall. 1885. (Ann. Rep. Wisc. Agr. Exper. Sta. 2:59-66).

Floral calendar (Science Almanac). 1884. (Science 4:573-575).

POLLINATION

Nectar: what it is, and some of its uses. 1880. (Comstock, Rept. on Cotton Insects. 319-343. pl. 3).

Where honey comes from. 1880. (Amer. Bee Journ. 16:137-138; 184; 232-233; 271-272; 386-387. f. 1-10).

Nectar and nectar secretion. 1919. (Amer. Bee Journ. 59:405-408. 3 ff.).

Physiology of nectar secretion. 1920. (Amer. Bee Journ. 60:7-9. 3 ff.).

Flowers and their visitors. (Cornell Review. 1880. 194-196).

Note on the perforation of flowers. 1881. (Bull. Torr. Bot. Cl. 8:68).
Fertilization of flowers by humming-birds. 1880. (Amer. Nat. 14:363-364).

On the structures which favor cross-fertilization in several plants. 1882. (Proc. Boston Soc. Nat. Hist. 21:410-440. pl. 6-8).

Adaptations to pollination. 1888. (Bot. Gaz. 13:134).

Darwin as a naturalist: Darwin's work on cross-pollination in plants. 1909. (Amer. Nat. 43:131-142).

The fertilization of *Aquilegia vulgaris*. 1880. (Amer. Nat. 14:731-733).
On the fertilization of *Calamintha Nepeta*. 1881. (Amer. Nat. 15:11-15. f. 1-2).

The fertilization of our native species of *Clitoria* and *Centrosema*. 1879. (Amer. Nat. 13:688-692. f. 1-8).

On the fertilization of *Euphorbia* (*Poinsettia*) *pulcherrima*. 1879. (Bull. Torr. Bot. Cl. 6:344-5).

Action of bees toward *Impatiens fulva*. 1880. (Bull. Torr. Bot. Cl. 7:20).

On the fertilization of several species of *Lobelia*. 1879. (Amer. Nat. 13:427-432. f. 1-9).

Observations suggested by the preceding paper (Eliot, Measurements of trimorphic flowers of *Oxalis Suksdorfii*). 1886. (Trans. Acad. Sci. St. Louis. 5:286-291. f. 3).

The heterogony of *Oxalis violacea*. 1882. (Amer. Nat. 16:13-19. f. 1-5).
Additional notes on passion flowers. 1884. (In Foerste, Amer. Nat. 18:820-821. f. 1-2).

Protandry of *Pastinaca*. 1882. (Bot. Gaz. 7:26-27).

The fertilization of *Salvia splendens* by birds. 1881. (Amer. Nat. 15:265-269. f. 1-4).

The fertilization of *Scrophularia*. 1881. (Bull. Torr. Bot. Cl. 8:133-140. f. 14).

On the fertilization of *Symplocarpus foetidus*. 1879. (Amer. Nat. 13:580-581).

The nectary of *Yucca*. 1886. (Bull. Torr. Bot. Cl. 13:135-141. f. 1-3).

Further studies of yuccas and their pollination. 1893. (Ann. Rep. Mo. Bot. Gard. 4:181-226. pl. 1-23).

SYSTEMATIC, ETC.

THALLOPHYTES

(Cryptogams)

Cryptogamic botany of Alaska. Introduction. 1904. (Harriman Alaska Expd. 5:1-9).

Salomonson, Bacteriological technology for physicians. 1889. (Wood's Med. & Surg. Monographs. 4:439-597. 72 f.). Translation from Danish.

- [Sensitiveness of certain bacteria to oxygen, etc.]. 1886. (Trans. Acad. Sci. St. Louis. 5:ii-iii).
- Observations on several zoogloaeae and related forms. 1885. (Studies from Biol. Lab., Johns Hopkins Univ. 3:193-216. pl. 12).
- Bacteria from a botanical standpoint. 1888. (Weekly Med. Rev. 17:88-92, 127-132).
- Species in bacteriology. 1889. (Weekly Med. Rev. 19:309-317).
- The Gymnosporangia. 1881. (Amer. Journ. Sci. and Arts. 21:332-3).
- Notes on the relations of two cecidomyians to fungi. 1884. (Psyche. 4:192-200).
- Preliminary list of the parasitic fungi of Wisconsin. 1884. (Trans. Wisc. Acad. Sci. Arts and Letters 6:106-144).
- The rose Peronospora. 1884. (Gardeners' Monthly 26:211-212. 1 f.).
- The onion mold. 1884. (Ann. Rep. Wisc. Agr. Exper. Sta. 1:38-44. f. 1-5).
- The apple scab and leaf blight. 1884. (Rep. Wisc. Agric. Exper. Sta. 1:45-56. f. 6-9).
- A few common apple fungi. 1886. (Ann. Rep. Minn. Hort. Soc. 14:32-55. ff.).
- A convenient laboratory plant. [Rhizopus]. 1885. (Bot. Gaz. 10:426-7. 1 f.).
- The grape rot. 1885. (Trans. Miss. Vall. Hort. Soc. 2; Trans. Wisc. State Hort. Soc. 15:190-198. f. 1-9).
- The genus *Cintractia*. 1885. (Bull. Torr. Bot. Club. 12:69-70. pl. 50).
- The spot disease of strawberry leaves. 1885. (Ann. Rep. Wisc. Agric. Exp. Sta. 2:47-58. f. 1-3).
- The wax-bean fungus. 1885. (Cultivator and Country Gentleman. 50:800. 1 f.).
- A yellow opium mold. 1886. (Contrib. Dept. Pharmacy. Univ. of Wisc. 2:5. f. 1-8).
- A spot disease of orchard grass, *Scolecotrichum graminis*. 1886. (Rep. U. S. Dep. Agric. 1886:129-131. pl. 8).
- Description of *Lycoperdon missouriense*. 1886. (Trans. Acad. Sci. St. Louis. 5:240. pl. 8).
- Heteroecismal Uredineae. 1885. (Journ. of Mycol. 1:25-26).
- The fungi of forage plants. 1887, 1896. (Beal, Grasses of N. Amer. 1:413-431. f. 159-175).
- The morels and puff-balls of Madison. 1888. (Trans. Wisc. Acad. of Sci. Arts and Letters. 7:105-120. pl. 7-9).
- A new disease of cultivated palms. 1898. (Ann. Rep. Mo. Bot. Gard. 9:159. 6 f.).
- Edible and poisonous mushrooms and toadstools. 1900. (Rep. Hort. Soc. Wis. 43:224-241. 1 pl.).
- Aberrant veil remnants in some edible agarics. 1904. (Ann. Rep. Mo. Bot. Gard. 15:83-85. pl. 30-39).
- The fungi of Alaska. 1904. (Harriman Alaska Expd. 5:13-64. pl. 2-7). Joint author with P. A. Saccardo and C. H. Peck.
- Two leaf fungi of cyclamen. 1916. (Trans. Ill. Acad. Sci. 9:143).
- Biology of Conjugatae. 1885. (Bot. Gaz. 10:256-258).
- The "working" of the Madison lakes. 1888. (Trans. Wisc. Acad. Sci., Arts and Letters, 7:121-129. 1 f. pl. 10).
- A cristate Pellaea. 1901. (Ann. Rep. Mo. Bot. Gard. 12:77. pl. 34).
- Alaskan species of *Sphagnum*. 1904. (Harriman Alaska Exped. 5:331-7.)
- The ferns and fern allies of Alaska. 1904. (Harriman Alaska Exped. 5:375-398. f., pl. 44).

SPERMATOPHYTES

(Flowering Plants)

- The botanical works of the late George Engelmann. (pp. 548. pl. and ff. 1887). Joint editor, with Asa Gray.
- [Revision of nomenclature conformed to use of earliest specific or varietal names] in Branner, J. C. & F. V. Coville, List of the plants of Arkansas. 1891. (Ann. Rep. Geol. Surv. of Ark. 4:155-252).
- Botanical observations on the Azores. 1897. (Ann. Rep. Mo. Bot. Gard. 8:77-220. Frontispiece and pl. 12-66).
- The swamps of southeastern Missouri. 1897. (Gard. & For. 10:370-371).
- Bearing of the distribution of the existing flora of Central America and the Antilles on former land connections. 1918. (Bull. Geol. Soc. Amer. 29:649-656).
- Plant materials of decorative gardening. 1. The woody plants. 1917, 1921, 1926. Urbana, Ill. 1917. pp. 204. 2 ed. pp. xliii 177. 1921. 3 ed. 1926.
- Catalog-record of woody plants, for use with Plant Materials and Landscape Gardening. Urbana, Ill. Cards. 1917. Winter botany. Urbana, Ill. 1918. pp. xl:394. Illustrated.

ACERACEAE

- The sugar maples, with a winter synopsis of all North American maples. 1894. (Ann. Rep. Mo. Bot. Gard. 5:88-106. pl. 4-38).

AMARYLLIDACEAE

- Amaryllidaceae. 1920. (In Standley, Contr. U. S. Nat. Herb. 23:105-142).
- The Agaveae of Guatemala. 1915. (Trans. Acad. Sci. St. Louis. 23:129-152. pl. 6-35).
- Agave Engelmanni. 1892. (Ann. Rep. Mo. Bot. Gard. 3:167, 168. pl. 55-56).
- Agave parviflora Torrey. 1894. (Ann. Rep. Mo. Bot. Gard. 5:164-165. pl. 32).
- The century plant, and some other plants of the dry country. 1907. (Pop. Sci. Monthly. 70:207-228. f. 1-22)
- Agave macroacantha and allied Euagaves. 1907. (Ann. Rep. Mo. Bot. Gard. 18:231-256. pl. 18-34).
- Variegation in the Agaveae. 1908. (Linsbauer, Wiesner-Festschrift. 332-356 ff., pl. 6-12)
- Agave rigida — Furcraea rigida — Agave angustifolia. 1908. (Ann. Rep. Mo. Bot. Gard. 19:273-287. pl. 29-35).
- The Mexican fiber agaves known as zapupe. 1909. (Trans. Acad. Sci. St. Louis. 18:29-37, pl. 1-6).
- Species in Agave. 1910 (Proc. Amer. Philos. Soc. 49:232-237. pl. 32-33).
- The smallest of the century plants. 1911. (Pop. Sci. Monthly. 77:5-15. f. 1-15).
- A dwarf form of Agave angustifolia. 1912. (Ann. Rep. Mo. Bot. Gard. 22:99-100. pl. 100-103).
- Revision of the agaves of the group Applanatae. 1912. (Ann. Rep. Mo. Bot. Gard. 22:85-97. pl. 73-99).
- The agaves of Lower California. 1912. (Ann. Rep. Mo. Bot. Gard. 22:37-65. pl. 18-72).
- Agave in the West Indies. 1912. (Mem. Nat. Acad. Sci. 11:1-298. f. 1-7. pl. A-E, 1-116).

- Agave. 1914. (Standard Cycl. Hort. 1:230-239. f. 138-144).
 Observations on Furcraea. 1910. (Ann. Jard. Bot. Buitenzorg. 2
 ser. suppl. 3:905-916. pl. 35-48).
 Furcraea. 1915. (Stand. Cycl. Hort. 3:1305-6).
 Precocity in a Furcraea. 1918. (Trans. Ill. State Acad. Sci.
 11:109-111. f.)
 Agave Ekmani, n.sp. 1926. (Fedde, Repert. 22:374).
 New Species of Agave from the Republic of Salvador. 1925. (Journ.
 Washington Acad. Sci. 15:393-5. 1 f.)

APOCYNACEAE

- The Missouri dogbanes. 1898. (Ann. Rep. Mo. Bot. Gard. 9:147. pl.
 44-45).
 Agave novae hispaniolenses. 1927. (Fedde Repert. 23:362-363).

AQUIFOLIACEAE

- Revision of North American Ilicineae and Celastraceae. 1889. (Trans.
 Acad. Sci. St. Louis. 5:343-357).
 Ilex longipes. 1890. (Gard. and Forest. 3:344. f. 46).
 Aquifoliaceae. 1897. (Gray, Syn. Fl. 1¹:388-391).

BEGONIACEAE

- An ecologically aberrant Begonia. 1904. (Ann. Rep. Mo. Bot. Gard.
 15:79-81. pl. 28-29).

BOMBACEAE

- Pachira sp. 1894. (Ann. Rep. Mo. Bot. Gard. 5:154-157. pl. 27).

BROMELIACEAE

- Tillandsia utriculata L. 1894. (Ann. Rep. Mo. Bot. Gard. 5:162-164.
 pl. 31).

CELASTRACEAE

- Celastraceae. 1897. (Gray, Syn. Fl. 1¹:395-401. See also Trans.
 Acad. Sci. St. Louis. 5:349-357).

CRASSULACEAE

- Crassula quadrifida Baker. 1894. (Ann. Rep. Mo. Bot. Gard. 5:157.
 f., pl. 28).
 Cotyledon orbiculata L. 1894. (Ann. Rep. Mo. Bot. Gard. 5:158-160.
 pl. 29).

CUCURBITACEAE

- Cucumis Melo Dudaim (L). 1894. (Ann. Rep. Mo. Bot. Gard.
 5:160-162. f., pl. 30).

FAGACEAE

- The chestnut in Illinois. 1917. (Trans. Ill. Acad. Sci. 10:143-145).
 The classification of the black oaks. 1912. (Proc. Amer. Philos. Soc.
 51:167-171. pl. 10-13).
 The large-fruited American oaks. 1915. (Proc. Amer. Philos. Soc.
 54:7-11. pl. 1-3).
 The oaks of America. 1916. (Proc. Nat. Acad. Sci. 2:625).
 Naming American hybrid oaks. 1917. (Proc. Amer. Philos. Soc.
 56:44).
 The ancient oaks of America. 1918. (Mem. Brooklyn Bot. Gard.
 1:492-501. pl. 13-22).

- The jack oak. 1919. (Trans. Ill. State Acad. of Sci. 12:108-118. pl. 139-143).
 A natural group of unusual black oaks. 1921. (Proc. Amer. Philos. Soc. 60:31-33. pl. 2-4).
 Quercus. 1922. (In Standley, Contr. U. S. Nat. Herb. 23:171-198).
 The American oaks. 1924. (Mem. Nat. Acad. Sci. 20; Quarto pp. v+255. ff. 7. pl. 420).

GERANIACEAE

- A study of North American Geraniaceae. 1888. (Mem. Boston Soc. Nat. Hist. 4:71-104. f., pl. 9-12).
 Geraniaceae. 1897. (Gray, Syn. Fl. 1¹:357-369).

GINKGOACEAE

- (Fruit of the maidenhair tree). 1885. (Trans. Acad. Sci. St. Louis. 4:cxxv).

GRAMINEAE

- The glands of *Eragrostis major* Host. 1889. (Proc. Soc. Prom. Agric. Sci. 10:70-72).

JUGLANDACEAE

- Juglandaceae of the United States. 1896. (Ann. Rep. Mo. Bot. Gard. 7:25-46. pl. 1-25).
 The pignuts. 1895. (Science, n.s. 2:136).

LEITNERIACEAE

- Leitneria floridana*. 1894. (Ann. Rep. Mo. Bot. Gard. 6:65-90. f., pl. 30-44).

LILIACEAE

- Aloe*. 1900. (Cyclop. Amer. Hort. 1:49-52. f. 68-70).
Aloe. 1914. (Stand. Cycl. Hort. 1:255-261. f. 160-172).
Apicra. 1900. (Cyclop. Amer. Hort. 1:75. f. 102).
Apicra. 1914. (Stand. Cycl. Hort. 1:309-310. f. 232).
Gasteria. 1900. (Cyclop. Amer. Hort. 2:628-629).
Gasteria. 1915. (Stand. Cycl. Hort. 3:1317-1318).
Haworthia. 1900. (Cyclop. Amer. Hort. 2:714-715. f. 1022).
Haworthia. 1915. (Stand. Cycl. Hort. 3:1433-5).
Hesperaloe. 1915. (Stand. Cycl. Hort. 3:1478).
Hesperoyucca. 1915. (Stand. Cycl. Hort. 3:1479).
 The desert group *Nolineae*. 1911. (Proc. Amer. Philos. Soc. 50:405-443. frontisp., ff., pl. 1-11).
Dasylyrion. 1914. (Stand. Cycl. Hort. 2:965-966).
Nolina. 1916. (Stand. Cycl. Hort. 4:2147-8).
Samuela. 1917. (Stand. Cycl. Hort. 6:3069).
The Yuccae. 1902. (Ann. Rep. Mo. Bot. Gard. 13:27-133. frontisp., pl. 1-99).
 Detail illustrations of *Yucca*. 1892. (Ann. Rep. Mo. Bot. Gard. 3:159-166. pl. 1-12, 44-54).
Yucca guatemalensis Baker. 1894. (Ann. Rep. Mo. Bot. Gard. 5:165-166).
 Miscellaneous observations on *Yucca*. 1898. (Ann. Rep. Mo. Bot. Gard. 9:141-146. pl. 40-43).
Yucca. 1902. (Cyclop. Amer. Hort. 4:1999-2001. f. 2760-2766).
Yucca. 1917. (Stand. Cycl. Hort. 6:3529-31).
Yuccas at the Missouri Botanical Garden. 1904. (Florists' Exch. 18:146. 2 f.).

- Additions to the genus *Yucca*. 1907. (Ann. Rep. Mo. Bot. Gard. 18:225-230. 1 f., pl. 12-17).
 An additional tree-yucca and one other species new to the United States. 1912. (Ann. Rep. Mo. Bot. Gard. 22:101-103. pl. 104-108).

LINACEAE

- A revision of North American Linaceae. 1887. (Trans. Acad. Sci. St. Louis. 5:7-20. pl. 3-4).
 Linaceae. 1897. (Gray, Syn. Fl. 1¹:344-349).

LORANTHACEAE

- Phoradendron. 1915. (Proc. Nat. Acad. Sci. 1:30-35).
 The genus Phoradendron. A monographic revision. 1916. (Urbana, Ill. The University of Illinois. pp. 224. frontispiece. pl. 245).
 Additions to the genus Phoradendron. 1927. (Bull. Torrey Bot. Club. 54:471-477).

MORACEAE

- Illustrations of a "strangling" fig tree. 1905. (Ann. Rep. Mo. Bot. Gard. 16:161-165. pl. 39-45).

ONAGRACEAE

- A revision of the American species of *Epilobium* occurring north of Mexico. 1891. (Ann. Rep. Mo. Bot. Gard. 2:69-117. pl. 1-48).
 A new *Epilobium*. 1890. (Zoe. 1:210-211).
 The North American species of *Gayophytum* and *Boisduvalia*. 1894. (Ann. Rep. Mo. Bot. Gard. 5:108-122. pl. 17-26).
 Revision des "Gayophytum" et des "Boisduvalia" de l'Amerique du Nord. 1894. (Le Monde des Plantes 4:126-127, 142-146, 177-182, 187-188. f. 19-21). Translation by A. Acloque.

ORCHIDACEAE

- Catasetum Gnomus*, Linden. 1896. (Amer. Florist. 11:292-293. f.).
Dendrobium nobile burfordiense. 1896. (Amer. Florist. 11:1024-1025. f.).
 The *Epidendrum venosum* of Florida. 1898. (Ann. Rep. Mo. Bot. Gard. 9:137-139. pl. 33).

OXALIDACEAE

(See also Geraniaceae)

- Oxalis*. 1887. (Bot. Gaz. 12:166-7).
 Subterranean shoots of *Oxalis violacea*. 1888. (Bot. Gaz. 13:191. pl. 12).
Oxalis. 1901. (Cyclop. Amer. Hort. 3:1181-3. f. 1601-3).
Oxalis. 1916. (Stand. Cycl. Hort. 4:2417-9).

PALMACEAE

- A Pacific-slope palmetto. 1901. (Ann. Rep. Mo. Bot. Gard. 12:79-80. pl. 85-87).

PIPERACEAE

- North American pipers of the section *Ottonia*. 1921. (Amer. Jour. Bot. 8:212-217. pl. 5-8).
 Peltate peperomias of North America. 1922. (Bot. Gaz. 73:133-147. pl. 1-4).
 New Piperaceae from South America and Mexico. 1926. (Jour. Washington Acad. Sci. 16:204-7).

Some puzzling pepper leaves. 1926. (Proc. Amer. Philos. Soc. 65:64-7. 4 f.).

Piperaceae cubenses. 1926. (Fedde, Repert. 23:1-31).

The Piperaceae of Panama. 1927. (Contr. U. S. Nat. Herbarium. 26:15-50, I-VII).

Piperaceae hispaniolenses. 1927. (Fedde, Repertorium. 23:303-333).

Note, Surle Piper reticulosum. 1927. (Bull. Soc. Bot. de France. 5 Ser. 3:458-460).

PLATANACEAE

Lettres à M. E. Gadeceau sur les Platanus. 1895. (Bull. Soc. Sci. Nat. de l'Ouest de la France. 5:35-36).

POLYGONACEAE

A revision of the American species of Rumex occurring north of Mexico. 1892. (Ann. Rep. Mo. Bot. Gard. 3:74-98. pl. 13-33).

RANUNCULACEAE

Thalictrum. 1886. (Bot. Gaz. 11:92-93).

North American species of Thalictrum. 1886. (Proc. Boston Soc. Nat. Hist. 23:293-304. f. 1-2, pl. 1).

RHAMNACEAE

Synoptical list of North American species of Ceanothus. 1888. (Proc. Calif. Acad. Sci. 2 ser. 1:106-118).

North American Rhamnaceae. 1889. (Trans. Acad. Sci. St. Louis. 5:358-369).

Rhamnaceae. 1897. (Gray, Syn. Fl. 1¹:401-419).

SALICACEAE

The foliar nectar glands of Populus. 1881. (Bot. Gaz. 6:284-290. f. 1-6).

SAPINDACEAE

[Water chestnut, lyche and "cinnamon-beans"]. 1885. (Trans. Acad. St. Louis 4:cxxvi-vii).

VERBENACEAE

Derivation of "Mastacanthus." 1896. (Amer. Florist. 11:291-292).

BIOGRAPHIC NOTICES

Four generations of memorable botanists. 1924. (Scientific Monthly. 19:53-62. Portraits of the de Candolles).

Alvin Wentworth Chapman. 1899. (Amer. Nat. 33:643-646. Portrait).

William Gilson Farlow. 1920. (Science, n.s. 51:81; American Jour. Bot. 7:173-181. Portrait).

George Lincoln Goodale. 1923. (Science, n.s. 57:654-656).

Asa Gray. 1888. (Trans. Acad. Sci. St. Louis. 5:xxiv-xxvi).

Carl von Linné. 1907. (Horticulture. 5:681. Portrait).

Henry Shaw. 1902. (Cyclop. Amer. Hort. 4:1663).

Edward Lewis Sturtevant. 1902. (Cyclop. Amer. Hort. 4:1748-9).

BIBLIOGRAPHICS, ETC.

Bibliographical record [relations of plants to insects]. 1881. (Psyche. 3:248-258, 280-289, etc.).

- List of works on North American fungi with the exception of Schizomycetes published before 1887. 1887. (Bibliogr. Contr. Library of Harvard Univ. 25:1-36). Joint author with W. G. Farlow.
- The Sturtevant prelinnean library. 1896. (Ann. Rep. Mo. Bot. Gard. 7:123-209).
- A list of books and papers published from the Missouri Botanical Garden . . . from September, 1889, to December, 1896, inclusive. 1897. (Ann. Rep. Mo. Bot. Gard. 8:221-228).
- A list of books and papers published by instructors in the Henry Shaw School of Botany, from September, 1885, to December, 1896, inclusive. 1897. (Ann. Rep. Mo. Bot. Gard. 8:229-232).
- A list of books and papers published from the Missouri Botanical Garden . . . from January, 1899, to December, 1903, inclusive. 1904. (Ann. Rep. Mo. Bot. Gard. 15:87-97).
- The classification of botanical publications. 1899. (Science, n.s. 10:713-717).
- A list of serial publications received at the library of the Missouri Botanical Garden. 1899. (Ann. Rep. Mo. Bot. Gard. 10:91-160).
- A supplementary list of serial publications received at the library of the Missouri Botanical Garden. 1904. (Ann. Rep. Mo. Bot. Gard. 15:98-129).
- Contributions from the Henry Shaw School of Botany. 1-25. 1914. (Urbana, Ill. pp. 727. pl. Editor).

MISCELLANEOUS

- Reproduction in the vegetable kingdom. 1879. (Cornell Review. 1879:265-269).
- Arrangement of herbaria, etc. 1886. (Bot. Gaz. 11:120-121).
- Bacteria [preservation in herbaria]. 1886. (Bot. Gaz. 11:150).
- Disposition of thick specimens. 1886. (Bot. Gaz. 11:157).
- Herbarium cases. 1886. (Bot. Gaz. 11:187-188).
- [Post-glacial wood]. 1900. (Trans. Acad. Sci. St. Louis. 10:xxiv-xxv).
- The administration of botanical gardens. 1910. (Science, n.s. 31:681-685).
- The botanic garden as an aid to agriculture. 1900. (Proc. Soc. Prom. Agric. Sci. 21:103-110).
- Technical horticultural education. 1893. (Florists' Exchange. 5:748-749).
- Medical botany. 1897. (Journ. Amer. Med. Ass. 1897:467-472; Pharm. Era. 18:634-637).
- Co-operation in biological research. 1898. (Science, n.s. 27:372-375).
- The progress made in botany during the nineteenth century. 1901. (Trans. Acad. Sci. St. Louis. 11:125-142).
- Address before the Central Botanists. 1906. (Science, n.s. 23:97-100).
- [Organization of the Carnegie Institution]. 1901. (Science).
- The National university: a suggestion. 1897. (Science, n.s. 5:345-347).
- The American Society of Naturalists—What academic degrees should be conferred for scientific work. 1904. (Science, n.s. 19:809-810).
- [Designation of honorary degrees]. 1903. (Science, n.s. 22:673-674).
- Botanical Society of America. 1906. (Science, n.s. 23:221-2).
- Botany and commerce. 1909. (Trans. Ill. State Acad. Sci. 2:84-88).
- [Convocation week]. 1909. (Science, n.s. 29:182).
- Report [on cotton insects]. 1880. (Comstock, Rept. on Cotton Insects. 215-230; 361-379).
- Carnivorous habits of bees. 1880. (Amer. Nat. 14:364).
- Unusual care of ants for aphides. 1887. (Psyche. 3:310-311).

- Myrmecophilism. 1889. (*Psyche*. 5:171-180).
 [Mexican "jumping beans"]. 1885. (*Trans. Acad. St. Louis*. 4:cxxv).
 [Silk tapestry from the ceiling of a corn-storing loft in Mexico]. 1896.
 (*Science*, n.s. 3:252; *Canad. Entomol.* 28:61; *Amer. Nat.*
 30:258-259).
- A nematode disease of the carnation. 1894. (*Rep. Amer. Carnation
 Soc.* 1894; 50-54 f.; *Amer. Florist.* 9:680-681. f.; *Florists' Ex-
 change.* 6:248).
- The Terceira dog. 1897. (*Amer. Nat.* 31:79. pl. 5).

ADMINISTRATIVE REPORTS, ETC.

- The Academy of Science of St. Louis: a biography. 1903. (*Pop. Sci.
 Monthly.* 62:117-130).
- Report on the [Henry Shaw] School of Botany. 1890. (*Ann. Rep. Mo.
 Bot. Gard.* 1:84-90,—and subsequent volumes).
- Report of the director [of the Missouri Botanical Garden]. 1890-1912.
 (*Ann. Rep. Mo. Bot. Gard.* 1-23).
- Missouri Botanical Garden [facilities for research]. 1895. (*Science*,
 n.s. 1:716-717; *Bull. Torrey Bot. Cl.* 22:329-333; *Amer. Nat.*
 29:668-670).
- The Missouri Botanical Garden. 1903. (*Pop. Sci. Monthly.* 62:193-221).
- The Missouri Botanical Garden. 1908. (*School Sci. & Math.*
 8:98-103, 2 pl.).
- Missouri Botanical Garden. 1893. A handbook, in several editions.
- A city plan for Saint Louis. 1907. *St. Louis.* pp. 110, pl. maps. Chair-
 man, General Committee, Civic League.

